OCTOBER, 1951

Traffic Engineering

Junction treatment, Route 99, Oregon

- The Institute of Traffic Engineers, Traffic Engineering and the Traffic Engineer
- Development and Current Activities of the Traffic Engineering Division, Oregon State Highway Department
- Making Traffic Engineering Work in Grand Rapids, Michigan
- A Study Plan of Commercial Vehicle Operations in Urban Areas
- Effect of Shoulder Parking on Vehicle Operation

CONVENTION ISSUE

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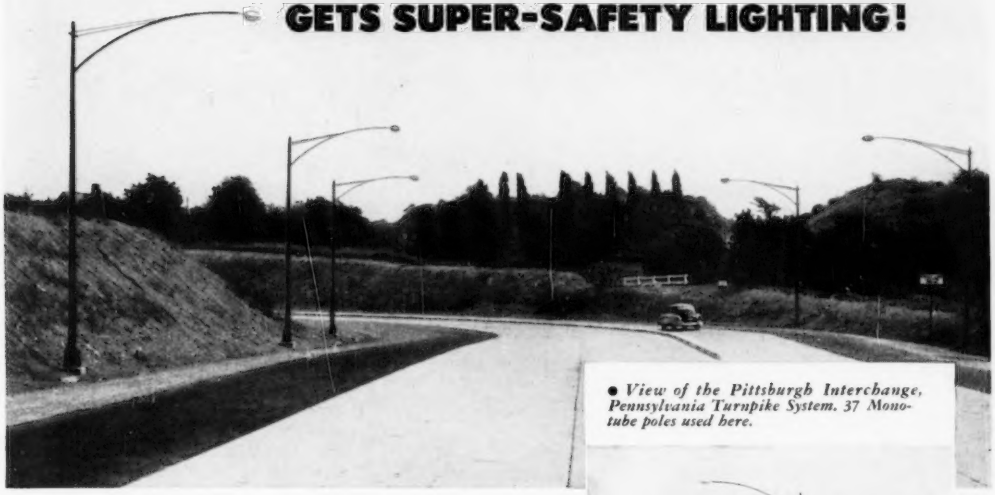

● *View of the Pittsburgh Interchange, Pennsylvania Turnpike System. 37 Monotube poles used here.*

● *Entrance to the Pittsburgh Interchange.* (*Photos courtesy of Pennsylvania Turnpike Commission*).

Interchanges of Pennsylvania Turnpike "Western Extension" Use

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WITH the opening of the Pennsylvania Turnpike's Western Extension, motorists now enjoy additional travel on a super-highway second to none.

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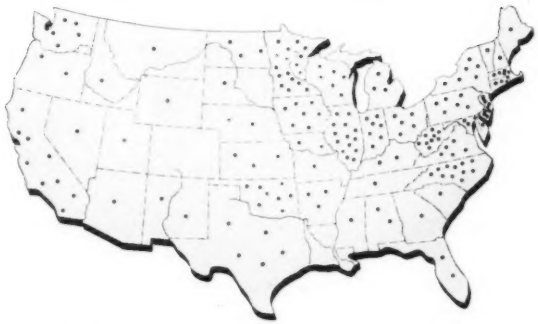

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

VOLUME XXII | OCTOBER, 1951 | NUMBER 1

COVER: Large over-head directional signs and pavement markings are used to simplify traffic operations at major intersections.
See article by R. H. Baldock

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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Frankly Speaking

TRAFFIC engineering, like traffic itself, is complex and dynamic. No part of its practice has as yet reached anything like stability. No solution to any traffic or parking problem has as yet been accorded universal recognition of finality. Consequently, it behooves all traffic engineers to keep an open mind, to keep abreast of the best traffic engineering thinking as it develops and as it goes through the practical acid tests under widely different conditions.

To help *Institute* members accumulate current, valuable technical data and to keep tabs on the best up-to-date traffic engineering techniques that have thus far been developed, we are launching the Traffic Engineer's Technical Notebook—a loose-leaf reference book which will have a minimum of text and a maximum of tabular and graphic material to which you can easily add new, improved and simplified data and withdraw information which has become obsolete. The Notebook is to be the project of no one person nor of any one ITE committee, but rather one to which each and every *Institute* member, irrespective of grade, will be expected eventually to make some contribution in some way, however small.

I am, therefore, asking that each and every member make it his business to start contributions to the Notebook moving as early as practicable to Editor Henry Evans.

On this universal *Institute* project, it will be understood that a suggestion to have someone else do something will not be considered a contribution. A suggestion made by anyone will automatically carry with it the obligation on the part of the maker, to see it through or, at least, to help in seeing it through.

So, let us all put every shoulder to the wheel and start the Traffic Engineer's Technical Notebook rolling.

Nathan Cherniack

President

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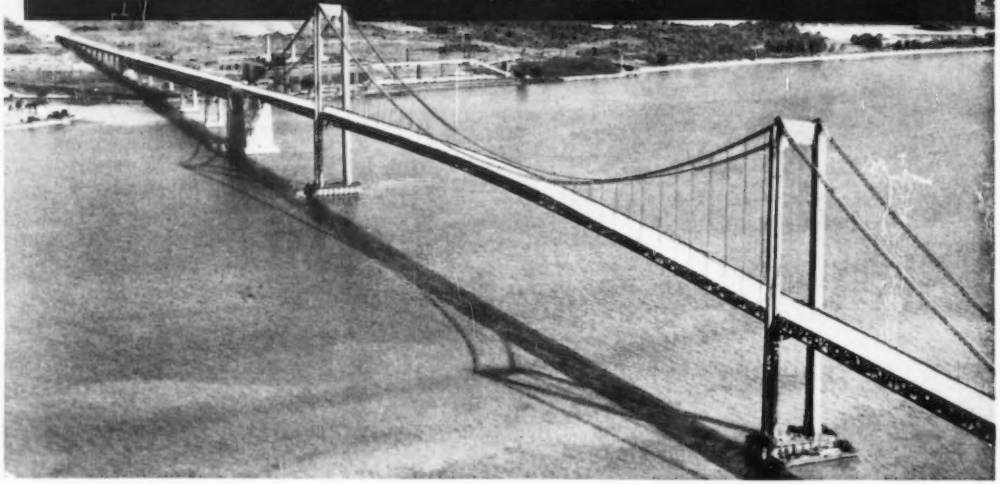

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The Institute Of Traffic Engineers, Traffic Engineering And The Traffic Engineer

Acceptance Remarks
Delivered at the 1951 Annual Meeting
By Nathan Cherniack, President ITE

Fellow Members of the Institute of Traffic Engineers:

IN electing me to the presidency, you have conferred upon me a signal honor. By your vote, you have expressed confidence in me to carry forward the ever-broadening objectives of the *Institute* and to carry on the traditions inaugurated by my predecessors. For these gracious acts, I want to thank you—each and every one of you—from the very bottom of my heart. No more words can express my gratitude to you any better; only the greater service which I shall try to render can express it more effectively.

Two Point Program

In progressing the various objectives of the *Institute*, you, of course, appreciate that there is still a great deal that needs to be done. I believe, however, that two important objectives deserve particular attention.

1. To create conditions whereby the *Institute* can render expanding and improved services to the membership;
2. To encourage the doing of those things that will constantly raise the professional standards of Traffic Engineering.

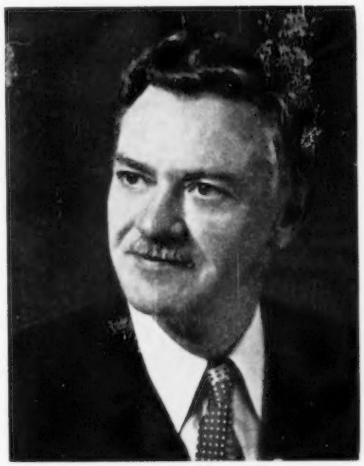
In the coming year, I intend to devote my efforts toward stimulating interest in these two prime objectives.

Institute Now Renders Considerable Service

As to the first objective, let us for a moment take stock of the services the *Institute* now renders the membership. For the $15 dues paid annually by a Member, the *Institute* is currently spending, on his behalf, $75. For example, your twelve monthly issues of TRAFFIC ENGINEERING costs $30 per member to produce. It takes another $30 a member to maintain the secretariat at *Institute* Headquarters. And rental of Headquarters has been free, thanks to the Bureau of Highway Traffic at New Haven, Connecticut.

You realize that the extra $60 being spent for each member does not grow on bushes. It takes work to produce it.

And yet, the $75 a member which the *Institute* expends in cash represents only a fraction of the services the *Institute* now renders. For example, no account whatever is taken of the many gratuitous services contributed by members who serve as editors, contributors of articles, on committees, not to mention the midnight oil burned by our Executive Secretary in discharging his manifold increasing volume of routine duties as well as his constant experimentation with new services.



Chase News Photo
Nathan Cherniack, the new ITE President

Individual Members Furnish Much Other Valuable Information

But that is not all. Many of you, I am sure, are well aware of the fact that individual *Institute* members are constantly furnishing one another valuable information. If these individual services were actually evaluated on a consultant fee basis, they would come to more than some recipients could afford to pay. Not only that, but these individual services are usually rendered on an as-and-when needed basis. They are, therefore, extra valuable because they are timely. Some of this up-to-the-minute material has not even been formalized into technical papers.

Traffic Engineer's Technical Notebook—a Data Bank

These valuable data are constantly being obtained by some members, on a personal basis. Why not make such information universally available to every member? This is one of the purposes of the proposed Traffic Engineer's Technical Notebook. Planned to be in loose-leaf form, it will act as the repository of up-to-date technical information, available to *all Institute* members, not only to just the few who happen to be in the know, and usable at the earliest possible moment. The data would be tested, criticized, im-

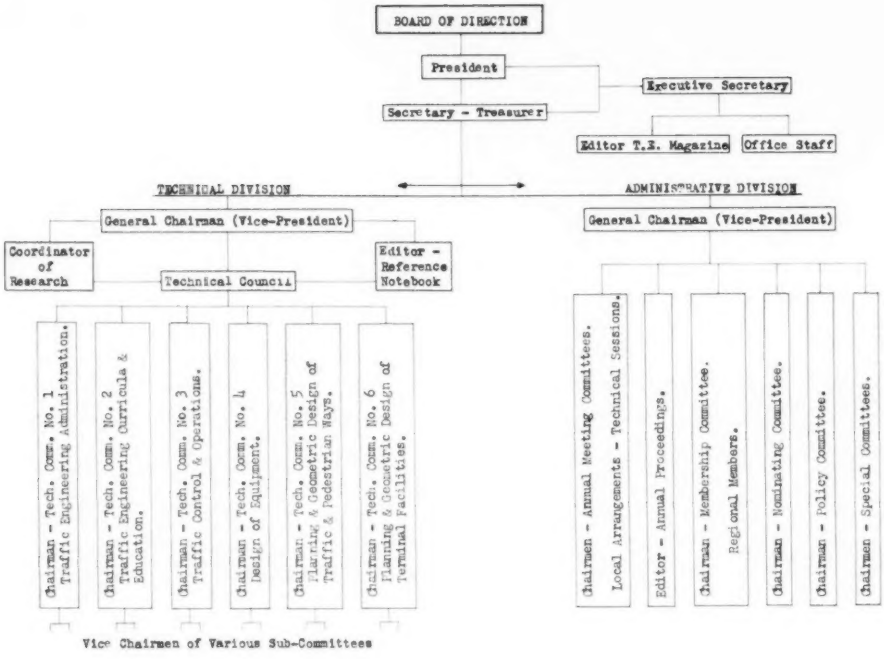

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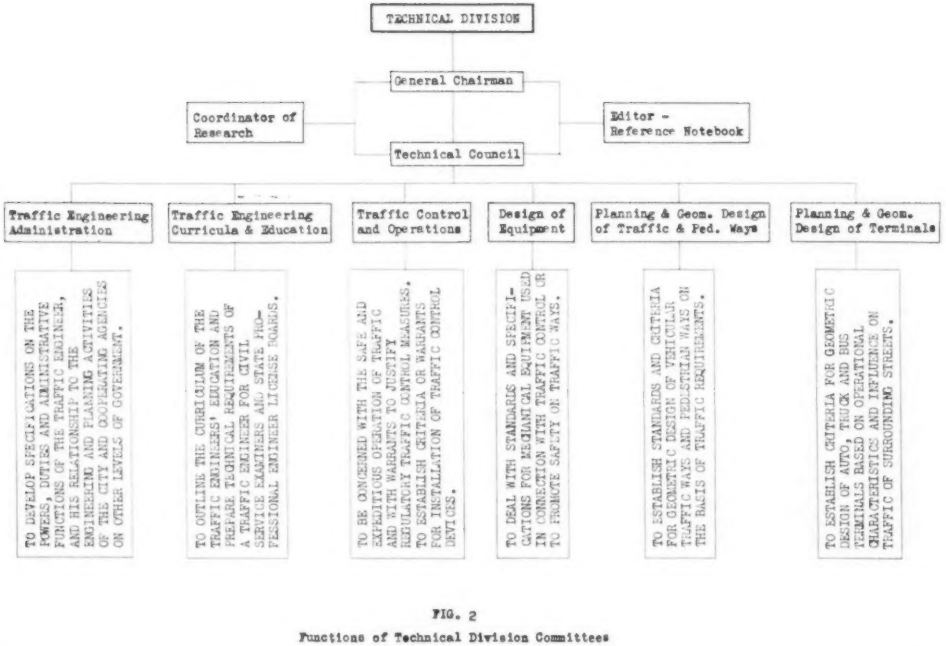
FIG. 1

Committee Structure of Institute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Traffic Control and Operations
Design of Equipment
Planning & Geom. Design of Traffic & Ped. Ways
Planning & Geom. Design of Terminals
TO DEVELOP SPECIFICATIONS ON THE POWERS, DUTIES AND ADMINISTRATIVE FUNCTIONS OF THE TRAFFIC ENGINEER, AND HIS RELATIONSHIP TO THE ENGINEERING AND PLANNING ACTIVITIES OF THE CITY AND COOPERATING AGENCIES ON OTHER LEVELS OF GOVERNMENT.
TO OUTLINE THE CURRICULUM OF THE TRAFFIC ENGINEERS' EDUCATION AND PREPARE TECHNICAL REQUIREMENTS OF A TRAFFIC ENGINEER FOR CIVIL SERVICE EXAMINERS AND STATE PROFESSIONAL ENGINEER LICENSE BOARDS.
TO BE CONCERNED WITH THE SAFE AND EXPEDITIOUS OPERATION OF TRAFFIC AND WITH WARRANTS TO JUSTIFY REGULATORY TRAFFIC CONTROL MEASURES. TO ESTABLISH CRITERIA OR WARRANTS FOR INSTALLATION OF TRAFFIC CONTROL DEVICES.
TO DEAL WITH STANDARDS AND SPECIFICATIONS FOR MECHANICAL EQUIPMENT USED IN CONNECTION WITH TRAFFIC CONTROL OR TO PROMOTE SAFETY ON TRAFFIC WAYS.
TO ESTABLISH STANDARDS AND CRITERIA FOR GEOMETRIC DESIGN OF VEHICULAR TRAFFIC WAYS AND PEDESTRIAN WAYS ON THE BASIS OF TRAFFIC REQUIREMENTS.
TO ESTABLISH CRITERIA FOR GEOMETRIC DESIGN OF AUTO, TRUCK AND BUS TERMINALS BASED ON OPERATIONAL CHARACTERISTICS AND INFLUENCE ON TRAFFIC OF SURROUNDING STREETS.

FIG. 2

Functions of Technical Division Committees

proved and then reissued in constantly improved form for easy and ready reference. The Notebook could thus be made into a valuable testing laboratory of the best Traffic Engineering thinking and current practices. It can become a veritable Technical Data Bank upon which you can draw on demand. But here is the *gimmick!*

If only a few do the depositing while the rest do the withdrawing, it won't be long before this data bank, like any other bank, will be bankrupt. On the other hand, if every member contributes his share of deposits as well as withdrawals, in time, every one will be earning big technical data dividends. In fact, the Notebook may even become, at times, your Technical Data Blood Bank. In a crisis, you may need a transfusion of fresh, up-to-date information, in a hurry. The Notebook will give you the data you need when you need it.

So, do become a depositor in our Technical Data Bank. Do volunteer to serve on one of the six technical committees where you can best contribute to the data bank. The greater your contributions, the greater your dividends. As a real data blood bank, the Notebook will offer you a variety of types of technical information in keeping with the different types of needs of Traffic Engineers.

Increased Institute Services Will Place Added Burdens on Board of Direction

Let us go back for a moment and examine our *Institute* affairs again. The *Institute* currently operates on a 30 to 40 thousand dollar annual budget. Present *Institute* services represented by this budget, large as they have come to be, are only a fraction of what they could and may grow to be. With only a little push from the membership, the expenditures for more and better services can go considerably higher.

The *Institute* business, as you know, is being operated, with the aid of the Executive Secretary and his staff, on a policy level, by your elected members of the Board of Direction. They have given generously of their time and energy. Those who have attended Board meetings regularly have often done so at considerable personal sacrifice for, currently, the *Institute* budget cannot stand the drain of any expenses for Board members.

In the guidance of the affairs of the *Institute*, there are no answers in the back of the book. The men you elect to the Board must find the answers in their own past experiences, in their native abilities, in their own good judgments. Consequently, if the *Institute* is to render increasing services to you, we must continue to elect to the Board of Direction the very best administrative talent in the *Institute* from each of our six regions.

In recent years, the business that has come before the Board has required Board meetings to extend for two full days and yet the Board had at times only a bare quorum in attendance. Every chapter should take an active interest in selecting not only the best representative of its district but one who can afford to give of his time and effort. On the other hand, every chapter should give their representative loyal support and find ways and means of making it possible for him to attend every meeting of your Board of Direction.

Active Participation in Institute Affairs Is Valuable Experience

We should encourage our younger members to aspire to be elected to the Board of Direction, to contribute their talents to the running of the affairs of the *Institute*. The best apprenticeship I know of, toward membership on the Board, is to serve faithfully as members, vice-chairmen, and chairmen of technical committees. It is only after such productive service to the *Institute* that members are ready to cut their wisdom teeth on the kinds of decisions they must face in the meetings of your Board of Direction.

By the same token, the type of experience provided by your Board of Direction is like vitamins added to the regular professional diet. Superior professional work alone will not gain you your greatest recognition. Participation in extra-curricular activities of the type which the *Institute* provides if added to outstanding work in the profession, has produced and will produce among our own members, commissioners, deputy commissioners, and executives in their respective communities. I am personally gratified that your Board of Direction has come to seek candidates for Honorary Members of the *Institute* in its own backyard, instead of going abroad where fields have appeared greener. Your *Institute* can furnish you the opportunity for service and in that way can also serve you by being your ladder of success, provided, however, you help conscientiously in building that ladder.

The Institute Can Bring Engineer and Manufacturer Together to Produce Continual Improvements In Traffic Control Equipment

In still another direction, the *Institute* can render greater service to the membership. We have, among our members, a wealth of mechanical and electrical know-how and ingenuity waiting to be tapped in the development of aids to traffic control and operations. The laboratories and talents of manufacturers are at the disposal of Traffic Engineers in the development of improved equipment for handling traffic expeditiously and safely. It seems to me that no city or state Traffic Engineer could possibly afford a staff of the size and type which manufacturers could place at his disposal to develop the precise type of equipment required for his needs. They also have the best sales engineering talent in the world. They need no assists from amateur salesmen. But they would appreciate, I am sure, if Traffic Engineers were to create for them opportunities to contribute to solutions of traffic problems through specially designed equipment.

In order to bring this manufacturing know-how into play, it is up to the Traffic Engineer to analyze and think through carefully his traffic problems, state clearly what is required to solve them properly and thus throw down a challenger for the creation of improved aids to traffic control.

Surely, in this electronic age, there must be better, more improved aids in handling the rapidly expanding traffic volumes than have been in use heretofore, newer methods of controlling traffic that are more sensitive to varying traffic volumes than much of the equipment now installed. It seems to me, too, that equipment could be developed that would require less material, considerably less field maintenance, possibly more replacements in the shop; in short, newer equipment that would bring about a host of possible significant advantages. In this area, it seems to me that the *Institute* could offer the Traffic Engineer a real service. It could supply a forum for formulating challenges to the ingenuity of manufacturers to produce the type of equipment

that Traffic Engineers will specify, equipment that would move traffic more efficiently, more smoothly, more safely, at the lowest possible unit costs.

Your *Institute* can thus function as a catalytic agent to bring about a healthy reaction between the best Traffic Engineering thinking and the ingenuity and know-how of equipment manufacturers. This type of interaction between engineer and manufacturer could stimulate and produce achievements which we had not even believed possible.

Traffic Engineering Must Be Placed On a Solid Scientific Foundation

Now, as to the second objective, namely, to raise the professional standard of Traffic Engineering. As Traffic Engineers, it is natural for us to wish to gain recognition by the engineering fraternity of our growing profession. To achieve this, however, we must be willing gradually to leave behind cookbook techniquest and, in their place, develop a philosophy and scientific principles of what would emerge as truly Traffic Engineering. We must recognize the hard fact that the burden of proof that Traffic Engineering is in fact a new branch of engineering rests upon Traffic Engineers. We cannot expect civil, electrical or mechanical engineers, in general, to accept Traffic Engineering as a new branch of engineering, upon our mere assertion.

The fact that, today, Traffic Engineering is usually expressed largely in terms of signs, signals and markings, or in other words, in terms of gadgets, and not in terms of principles, is embarrassingly revealing. What we need and need badly, therefore, is a more scientific approach. We must classify the myriads of traffic problems, reduce them to systems of logical abstractions and subject them to theoretical engineering solutions. In this way, we could develop a growing set of recognized principles of Traffic Engineering. Thus, structures has its basic fundamental beam theory, hydraulics a Bernouli theorem. Traffic Engineering as yet has no such outstanding fundamental principles. When developed, however, they would rest on a combination of principles of physics, geometrics, basic engineering psychology and economics. Over the years, we have catalogued sufficient traffic problems and their empirical solutions. We are now ready for distilling out of the accumulation of all these technical data, a philosophy and principles of traffic engineering.

Traffic Engineers Will Be Recognized

Finally, let us look at Traffic Engineers themselves. In the past, most practicing Traffic Engineers were trained in basic engineering. Upon this foundation, they have superimposed either practical experience in the rational solutions of traffic problems or have had courses in the theoretical but still empirical treatment of hypothetical traffic problems, or both. With only several decades of experience such as Traffic Engineers have had, there is naturally some reluctance on the part of the older branches of engineering to recognize the new branch of Traffic Engineering. Consequently, we have a job before us—to help develop the necessary and adequate proof that Traffic Engineering is a real branch of engineering, and that traffic engineers, in fact, practice what can truly be recognized as engineering. It is up to us to develop these proofs and to present them to those in the older branches of engineering who have won their spurs, and who are thus privileged to sit in judgment upon a newcomer. I am sure, however, that they would be glad to accord us the recognition which we so ardently aspire to (in fact, are actually in process of so doing), if only we undertook vigorously to present a strong case. In the *Institute*, we have the talent to develop adequate proof. We have the inspiration. All we need now is the perspiration to achieve our aspiration.

Conclusion

To sum up then. I am sure you will all agree that the *Institute* should render constantly expanding and improved services to the membership. I firmly believe it can—if every member were conscientiously to do his share.

I know, too, that you will agree that the practice of Traffic Engineering should gradually be made to rest on a recognizable, solid foundation of scientific principles and thus evolve as a truly new branch of engineering. Only through this method will Traffic Engineers gradually take their place as a group of engineers recognized by their peers and respected in every community in the land because of continual achievements in making transportation on streets and highways of the nation safe, fast, comfortable and convenient.

Colored Route Markers In Bloemfontein, South Africa

Colored route markers as used in the U.S.A. to help motorists in the "Hub," city of Bloemfontein, South Africa, have been recommended by Mr. S. C. P. DeBruin (Affil. Mem., ITE), Chief Traffic Officer.

Mr. DeBruin and the City Engineer recently reported to the City Council as follows:

"We are of the opinion that some congestion in the central areas of the city is caused by persons traveling through the city instinctively making for the central areas and from there endeavoring to find their way outwards on the route they wish to travel.

"We have considered the advisability of very much greater signboarding than exists and realize the practical difficulties and expense of this method. We are also conscious of the fact that few motorists should be allowed to let their eyes wander searching for traffic direction boards, when their eyes should, in fact, be as close to the road as possible.

"We venture to suggest, therefore, that the problem can be better solved by the use of colored routes. By this we mean that, as a motorist enters town on any route, he would be given a bank of name boards with the colour or dual colour attaching to that name board, illustrated against it. By colour banding a series of street lighting poles along that route with the appropriate colour, his journey through the city is simplified as he or his passengers have only to spot that colour and follow it.

"By means of the dual colour, traffic can be diverted away from the business heart of the city and taken around the inner ring roads.

"This system is not a new one. It was, in fact, frequently used in the complicated street systems that the army had to traverse in some of the towns during the last war and personal experience of it in Cairo has shown that it can be an invaluable aid to quick and easy movement through a city."

Mr. DeBruin reports that the City Council has accepted the report and has referred it to the Royal Automobile Club and the Automobile Association.

Development And Current Activities Of The Traffic Engineering Division, Oregon State Highway Department

By R. H. Baldock

State Highway Engineer, State Highway Department, Salem, Oregon

History of Development

THE position of Traffic Engineer was first established in the Oregon State Highway Department in January, 1930. Efforts of this initial one-man organization were directed toward review of signing practices with respect to the highway system, looking to standardization of sign types and their usage. Rapid expansion of vehicular usage soon required development into a broader field of operations to include many phases other than elementary signing.

With the inception of the State-wide Highway Planning Survey early in 1936, the responsibilities of the Traffic Engineer were expanded to include the duties of Planning Survey Manager. Although traffic-engineering operations were not forgotten, this phase of the work was temporarily submerged by reason of the organization and promulgation of planning-survey operations requiring the major attention of the Traffic and Planning Engineer. In order to carry on this additional work, there was then established a Department of Traffic Engineering and State-wide Highway Planning Survey administered by the Traffic Engineer. In late 1942 the traffic and planning unit of the Oregon State Highway Department was designated the Traffic Engineering Division, under the administration of the Traffic Engineer, which is the current organizational status.

The Traffic Engineering Division

The work and responsibilities of the Traffic Engineering Division are expressed in two phases: current short-term traffic-control operations and long-range studies necessary in planning highway facilities. The organizational designations corresponding to the two phases of work are the Traffic Control and the Planning Survey sections. These two sections maintain close coordination and the Traffic Control section draws heavily on the Planning unit for basic statistical information that may be required.

The Traffic Engineering Division is currently operated on an annual budget of $345,000, which amount includes 1½ per cent of Oregon's federal-aid apportionment. The total budget of $345,000 is allocated to subsections; namely, Traffic Control and Planning Survey in the amounts of $120,000 and $225,000, respectively. Current operating personnel in the Traffic Engineering Division amounts to 74 employees, with this number distributed 30 and 44 to the Traffic Control and Planning sections, respectively.

Traffic Control Section

General

The Traffic Control section is headed by the Traffic Control Engineer who is responsible for the investigation and analysis of various traffic problems. In all such operations the many factual tools of the Traffic Engineer—traffic volume, speed, accidents, physical conditions—are brought to bear in order that the final solution will be one based upon facts rather than upon personal opinion. Recommendations are reviewed by the Traffic Engineer and transmitted to the Assistant State Highway Engineer for consideration and final decision.

Accidents

A traffic-accident report is one of the basic sources of information. A complete analysis of accidents is important not only for the value that may be derived from mass statistics, but also for the value of such information in carrying on unit studies and investigations looking to proper control measures or treatment at a particular location. The Secretary of State is, by Oregon law, the prescribed repository for accident reports. Through long-standing arrangement, however, the Traffic Engineering Division has been permitted use of the original reports for a sufficient period of time to make analyses thereof through codification of data. Such treatment permits quick compilation of statistical summaries and such special factual correlations as may be required. Recommendations for improvements in highway design are made by the Traffic Engineer when accident reports indicate error in design of highway facilities. The use of accident data is by no means restricted to the Traffic Engineering Division. Periodic statistical reports are furnished the office of the Secretary of State in the form of monthly, quarterly, semiannual, and annual summaries for use of that office in its safety-education activities. Similar service is afforded the City of Portland, the one major metropolitan city in Oregon, and in addition requests for accident information on the part of other cities and of counties

are likewise cared for. As an indication of the volume of work handled in accident analysis, during the year 1950 some 70,000 accident reports were processed involving 150,000 punch cards. It might be pertinent to state at this point that Oregon law requires the reporting of *all* traffic accidents.

Traffic Signal Installation

Requests for traffic-signal installations are referred to the Traffic Control section for investigation and recommendation. It is not to be inferred from this that the Traffic Engineering Division does not initiate projects where it appears that there is need. The yardsticks or warrants, as set forth in the Manual of Uniform Traffic Control Devices, are adhered to quite closely and, coupled with priority of need and budgetary controls, final decision and recommendation is made. Recommended projects, as finally authorized by the State Highway Engineer and the Highway Commission, are turned back to the Traffic Control section for preparation of detailed plans and specifications which, in turn, are transmitted to the Maintenance Division, if the job is to be done by state force, or to the Bridge Division, which handles the letting of contracts when such work is to be done by the contract method.

In the matter of uniformity of traffic-control devices, the Oregon law provides that all such installations on public highways and streets shall be of uniform type, as prescribed by the Oregon State Highway Department. With respect to signalization on urban highway extensions, the Traffic Control section cares for the investigational work with reference to the warrant for signalization in the first instance. In implementing installations on urban highways, a state-city cooperative agreement is drawn; which agreement, among other things, requires that the city and the state share equally in the capital outlay, with the city committed to stand 100 per cent of maintenance and operation costs. The timing of the signals, or any change therein, must be approved by the State Highway Engineer.

The standard signal installation, as now used, has on the far overhead span wire a mounted vehicular signal and on corner posts the bracket-mount wait-walk signals. This arrangement was first adopted in 1941, with initial installations being made in the city of Klamath Falls. The far overhead vehicular signals are heavily louvered, which forces the pedestrian to govern his movements by the corner-post walk-wait installations and thus serves to prevent his "jumping the gun."

Photo by Oregon State Highway Commission

Models are used in the design of one-way couplet, including two one-way bridges.

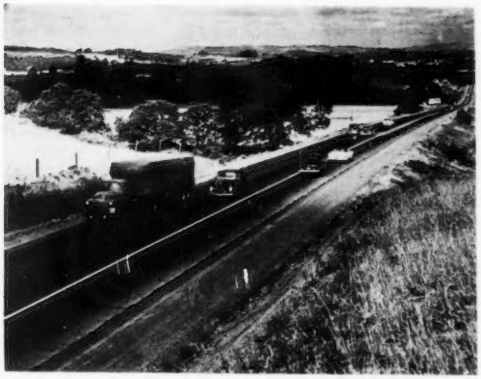
Speed Zoning

The 1941 State Legislature passed a speed zoning law to supplement and permit greater flexibility with respect to the old statutory blanket law calling for 20, 25 and 55 MPH indicated speeds in business, residential and open road, respectively. This legislation permits the raising or lowering of the blanket statutory speeds when a traffic engineering investigation has been made as a pre-requisite to such change. The law vests speed zoning authority with two bodies or agencies, the Oregon State Highway Commission and the State Speed Control Board. The first named has jurisdiction with respect to rural portions of the state highway system, and the Speed Control Board, comprised of the Chairman of the State Highway Commission, the Secretary of State, and the Superintendent of State Police, has jurisdiction with respect to city streets and county roads. Generally the State Highway Engineer serves as the representative of the Chairman of the State Highway Commission at the meetings of the Speed Control Board. The traffic engineering investigation is a function of the Traffic Control section with respect to both bodies having jurisdiction. In the instance of the State Speed Control Board, the Traffic Engineer of the State Highway Department is designated Secretary to the Board. The engineering investigation with respect to speed zoning is a very thorough one and includes volume check, vehicular speed sample, past accident record, and physical nature of the subject section. As of this writing some 300 miles have been considered and investigated for speed zoning in many short sections over the state.

Education and Design

The Traffic Control section does not actively spearhead educational or promotional activities in the field of traffic Safety. However, it does cooperate with those agencies having to do with these particular functions. An example of such cooperative effort is the working relationship with the office of the Secretary of State with regard to the organization and establishment of schoolboy patrols. The office of the Secretary of State, through its Safety Division, makes the initial investigation with respect to the establishment of schoolboy patrols, with the Traffic Engineer advising in the matter of traffic. If circumstances are such as to warrant establishment of a patrol, the Highway Department supplies the necessary equipment; i.e., yellow helmets, Sam Browne belts, signs, and pavement markings.

Probably the most important function, or activity, of the Traffic Control section is the study and consideration given to new facilities. In this connection the Traffic Engineering Division works closely with personnel of the Design Division in order that projected improvements may incorporate the utmost in safety and ease of movement. The prime function of the Traffic Control section is to study and check details of geometric design. The thorough study given major projects illustrates the close relationship which is maintained between the two subsections of the Traffic Engineering Division; namely, the Traffic Control and the Planning sections. Over and above the checking of details of the geometric design of particular projects, the larger jobs require study with respect to economic justification and traffic expectancies, the basis of which is found in the origin-destination studies and volume count surveys, which in the first instance were a function of the Planning section.



Truck passing lane on a long hill.

One-way Streets

The one-way street couplet has found increasing use in solving the capacity problem on urban highway extensions. The City of Portland has gone somewhat further in the establishment of a sizable one-way street grid in the central business district. This latter has proved most effective, encompassing an area of some 250 square blocks. In the city of Eugene (population 35,700) the City has seen fit to initiate a one-way street grid in the downtown business area, with considerable success, this plan having been in effect since December 1948. In both Portland and Eugene, the one-way grid was preceded by one-way couplets on state highway routes. A plan for one-way couplet treatment with respect to the urban highway extension through the city of Salem (population 43,000) plus a progressive signal system thereon, is currently underway. This plan, in common with many others of like nature, is not considered a temporary measure but rather is a part of an over-all plan integrated with the development of the new trans-Willamette River bridge facilities. Thus far one-way couplets have given relief to about nine cities in Oregon. Many more are now under study. Observation and experience with respect to one-way street operation have been sufficient, not only in Oregon but nationwide, to establish it as one of the most effective and cheapest "tools" of the engineer in realizing his objective of providing much-needed increased traffic capacity and at the same time minimizing friction and traffic accident potentialities.

Tourist Traffic

Tourist traffic in Oregon is increasing yearly and has become one of the major "industries" of the state. Much promotional work is done on this score and every effort made to provide for the needs and the pleasure of the visitor. This situation makes a rather perplexing problem, in so far as highway administration is concerned, by reason of the extreme fluctuations in traffic on the main arterial highways during the different seasons of the year. Traffic fluctuation on the principal highways by reason of tourist travel varies from a low of 50 per cent of the average daily for the year to a high of 170 per cent of the average daily value. With strangers constituting a high percentage of the total traffic stream during peak seasons, the Traffic Engineer must give more than the normally required effort to provide signings, markings, destination signs, et cetera, that are purposeful, concise, and have maximum readability.

Commercial Transport

Commercial transport is a major factor in the economy of Oregon in common with other Northwest and Pacific Coast states. An appreciable portion of this commercial transport is the log truck semitrailer, which is a factor that must be given consideration in design work. Of necessity there has had to be somewhat of an upgrading of the design used in considering highway alignments, particularly curvature, channelization, lane widths, et cetera. The maximum loads carried by these logging vehicles present even more of a problem than do the normal commercial truck combinations on two-lane highways on steep grades. In this connection, an increasing amount of work has been done in the development of a third lane for trucks on ascending grades to provide a "passing track."

Scale Models

During recent years, considerable use has been made of scale models of proposed highway improvements, which work is cared for by the Traffic Control subsection within the Traffic Engineering Division. These scale models have proved to be of considerable value in pointing up desirable revisions in design traffic-wise as well as in affording a medium of public education and understanding of projected new facilities.

Planning Survey

The Planning section is headed by the Planning Survey Engineer and is a cooperative unit of work with the Bureau of Public Roads. The operating budget is comprised of state and federal moneys in the same pro rata as established for federal contributing funds on construction work. The subareas of study carried on in this organizational unit follow much the same pattern as Planning Survey units in other states. This section is the principal source of basic data necessary to the formulation of both short- and long-range study in the field of highway design, highway economics, and traffic-control operation.

Traffic Counts

One of the principal activities of the Planning Survey is the state-wide traffic-counting operations. Current annual expenditure for this phase of work amounts to $60,000 and involves personnel of 15 employees (exclusive of 400 casual employees). By reason of the pattern established during the initial comprehensive survey of 1936-1937, the volume data were for a number of years obtained through manual counting procedures; however, since 1949 there has been a general change-over from an extensive program of manual counts to one which makes more extensive use of automatic equipment. This change-over has been made gradually in order not to lose the continuity of data necessary in the development of long-range trends which are prime factors in making traffic forecasts and development of long-range highway programs. The change in procedure and method of obtaining traffic audits has permitted more comprehensive coverage of the state road net than was possible with the less extensive and more costly manual-count operations previously carried on. The use of automatic equipment affords much greater coverage and more reliable data with respect to the total vehicles. It is believed that the skeletonized schedule of manual counts currently in operation offers a sufficient sample with respect to vehicular classification to serve the needs, and it is believed that much better service can be rendered for the dollars expended. There are currently in operation 14 permanently installed automatic re-

Photo by Delano Aerial Surveys

Aerial view of couplet—Pendleton.

cording machines, 20 portable recording-type counters, and 40 non-recording-type equipment. Plans for the future envision additional permanent automatic recorder installations over and above those now in operation. With the present plan of operation, about 2000 counts will be obtained during the year at 1500 locations. The end product of the traffic-count operations is exemplified in the yearly reports which are published and which serve as ready reference for operational needs.

Road Inventory Studies

Road Inventory Survey operations were reactivated in 1947 and are currently under way. The work schedule formulated in 1947 contemplated a reinventory of the street and highway system of the entire state to be completed in a five-year period. Actual progress, however, has not kept pace with this schedule, due primarily to difficulty in obtaining qualified employees, notably drafting personnel, to carry on certain phases of the work. This work tends to go hand in hand with the remapping, and these two companion phases currently operate on a budget of $49,500 and with 14 employees.

The prime purpose of road inventory and mapping operations is to keep a complete and, as far as possible, current record of all public highways in the state. In addition to establishing the physical location and the alignment of the road net, detailed information is obtained with respect to the roadbed section and the roadside culture. These data in map form find extensive use, not only in the department but by many outside agencies and persons as well.

Road Cost and Earnings

One of the activities carried on in the Planning section is the road-cost and earnings studies. The purpose of this particular work is to provide a continuing record that will show, both for the highway system in its entirety and for the component parts thereof, the degree to which the various highways are paying their way. The result of this phase of study is to relate the total cost of a particular section to the revenue accruing in the form of fuel tax and other transportation imposts. The index or solvency quotient thereby derived is a useful economic yardstick.

Origin-Destination Studies

In recent years the origin-destination type survey has been brought into sharp focus as a prerequisite in planning and development of traffic facilities. Many surveys of this type have been carried on as a part of the Planning Survey functions. Closely allied to the origin-destination survey is the parking study. The largest single project of this nature was that conducted in the City of Portland in 1941. The home interview sampling technique was followed in this survey, and the published report was used to considerable advantage in considering the development of traffic facilities in the Portland metropolitan area. Many other origin-destination surveys have been made since that time, and several are presently programmed.

Minor Planning Survey Functions

Over and above the major subphases of Planning Survey operations as outlined, there is a multiplicity of continuous statistical compilation work in the field of fuel consumption, vehicle registration, road-mileage reports, truck-weight studies, tourist travel, et cetera. These lesser endeavors are routine and continuing in nature and supply information necessary to proper and intelligent highway administration and evaluation of current needs in programming for the future. During legislative sessions, the Planning Section (and the Traffic Engineering Division as a whole) has proved a prolific source of basic information, particularly in the field of highway legislation.

Planning Surveys as Part of the Traffic Engineering Division

Considerable discussion has been had in recent years as to whether, from an organizational standpoint, traffic-control operations and planning activities should be operated under one head, or in one division, as against separation of these two functional units. No attempt will be made to launch into a long discussion of this matter; however, it can be said that the close working relationship between these two units as operating in the Oregon department has proved quite satisfactory and has eliminated much duplication of effort. The Oregon Traffic Engineering Division operates with centralized control which may not be possible in more populous states where decentralization may be necessary. Oregon has had some favorable comments with respect to its signing, pavement marking, and general traffic-control work, and it is believed that such measure of success as has been realized is largely traceable to the strong centralized control. The department adheres, with very few exceptions, to the precepts and examples as set forth in the National Manual on Uniform Traffic Control Devices.

Economic Value of Roads Stressed At Hague Meeting

The economic value of roads was stressed at a recent meeting of the Third World Petroleum Congress at The Hague. Discussion of the subject followed the reading of a paper, "The Economic Use of Roads," by Christopher T. Brunner, chairman of the publicity committee of the British Road Federation. During the discussion, Mr. M. T. van Staveren, director, Centraal Overleg, Netherlands, supported Mr. Brunner's conclusions that road construction and road improvement are vital to economic stability and growth.

Making Traffic Engineering Work In Grand Rapids

By Jerome D. Franklin (Assoc. Mem., ITE)
City Traffic Engineer, Grand Rapids, Michigan

This is the fifth in a series of articles to be published in "Traffic Engineering" magazine. Articles of a similar nature, written by traffic engineers of cities of various sizes in several parts of the country, will appear in future issues of "Traffic Engineering."

GRAND RAPIDS, the second largest city in Michigan, serves as the county seat of Kent County and as the shopping center of Western Michigan. In addition to the manufacture of its world famous industrial and commercial products, it served as host to over 150 state and national conventions during the past year.

Since 1941, passenger car registration in the county has increased 36 per cent, and today there are 97,495 cars. Besides these, there are 28,450 trucks, making a total of 125,945 motor vehicles registered in the county. Naturally, some of these vehicles are not always destined for Grand Rapids, but the greater majority are; and the remainder are in the city frequently.

Kent County has a 1950 population of 287,000, with more than 175,000 people living within the city limits. Thus, there are ratios of 2.94 people per passenger car and 2.28 people per motor vehicle in the county.

History

In 1949, after considerable agitation by the various civic and service groups interested in safety, and because of the ever-increasing number of vehicles, the City Commission adopted an ordinance permitting the City Manager to secure the services of a Traffic Engineer.

On August 1, 1949, the Division of Traffic Engineering was formally organized as a separate department of the city government. With the exception of the Traffic Engineer, the staff consisted of former employees of the Police Department who previously were responsible for carrying on this assignment.

Administration

The Traffic Engineer is directly responsible to the City Manager. He is an official member of the City Traffic Commission, and is directed, by ordinance, to cooperate with the City Planning Commission and the Municipal Automobile Parking Authority. Naturally, for successful operation, the Traffic Engineering Division must in addition coordinate its activities with the City Engineer's office, the Police and Fire Departments and the majority of the remaining municipal agencies.

A typical signal installation.

In keeping with its assignment to provide the safest and most efficient method of transporting people and goods within the city, the Division has many important functions. It is responsible for the location and timing of traffic control signal installations; the placing of warning, directional and regulatory signs; the painting of pavement markings; the determination of loading zones; consulting with the motor coach company as to bus routing and stops; the location of taxi zones; curb cut design and approval; the determination of need and direction of one-way streets; the marking of detours and special and emergency regulations; parade routing; channelization design; parking meter location and removal; parking lot design for industrial and church groups; and other duties which are generally attributed to the profession.

Organization

The present office staff of the Division is as follows:

1 Traffic Engineer
1 Assistant Traffic Engineer
1 Civil Engineer
1 Traffic Investigator
1 Clerk-Stenographer
1 Clerk

The usual office routine is conducted by the above, with the exception of accident location files and accident spot maps which are maintained by the Traffic Division of the Police Department. However, inasmuch as all accidents are reportable in Grand Rapids and because the Police Department makes extensive use of the spot maps for enforcement purposes, little efficiency is lost in their use for traffic engineering purposes since the files are readily available to the Traffic Engineering Division. In the very near future, in fact,

the Traffic Engineering Division and the Police Traffic Division are to be transferred to adjoining offices in a newly-acquired building.

Pavement Marking and Signs

The field crew of this section consists of:

1 Foreman (Public Works)
1 Sign Painter
3 Maintenance Workers
3 Laborers
3 Laborers (Summer—temporary)

This group is responsible for the preparation and installation of all signs and markings in the city. In the sign shop, all signs are processed from the initial purchase of the steel to the finished product. Whenever practicable, the silk-screen method is used, and all warning signs are reflectorized. During the winter months, the crew strips and re-processes signs which have become unreadable. Within the past year, a two-line striping machine has been purchased. This piece of equipment, especially built for Grand Rapids, is now used to mark state trunklines in the city, a function which was formerly performed by the State Highway Department. This not only allows greater economy, but permits the streets to be painted a great deal earlier than was previously possible. A smaller striping machine also is used for spraying cross-walks, stencils and curbs.

All of the signs and markings conform, as nearly as possible, to the "Manual on Uniform Traffic Control Devices for Streets and Highways." In order to better serve the city government, the sign shop also processes signs for any other municipal department at cost.

Four trucks and one passenger vehicle are assigned to the field crew; and two passenger vehicles are assigned to the office staff. In order to increase operating efficiency, two of the trucks are equipped with two-way radio, while the staff cars, and the office, itself, are equipped with receiving sets.

Parking Meters

The field crew of this section consists of:

1 Parking Meter Supervisor
3 Parking Meter Servicemen

This section is responsible for the installation and removal of all parking meters. It collects the meter revenue and services the 1,450 meters now in our streets in the central business district. In addition, it hoods meters when necessary, and keeps records for billing and maintenance purposes. Because of prior unorganizational set-up, this section was assigned to the Police Department; however, as of this fiscal year, it will become the financial responsibility of the Automobile Parking Authority since the parking meter funds ($130,000 annually) were pledged against the revenue bonds which were sold to finance the erection of a new 320-car parking ramp. Nevertheless, the Traffic Engineering office actually will continue to issue orders concerning the individual installation, hooding and removal of meters. A separate shop and a truck equipped with two-way radio are provided for the section.

Traffic Signals

The field crew of this section consists of:

Channelization improved traffic operations at this intersection.

1 Police Signal Superintendent
1 Line Foreman
2 Linemen
2 Electricians

This function, similar to the Parking Meter Section, is still assigned to the Police Department. It is responsible for the installation, maintenance and removal of all electrical traffic control equipment. However, the locations where traffic control signal installations are warranted, the design and the timing schedules are the responsibility of the Traffic Engineer's office. In 1949, a master control unit, regulating the majority of the signals in the central business district was put in operation. One passenger car and two fully-equipped trucks with two-way radios are assigned to this section.

Street Lighting

The Street Lighting Division is a part of the Department of Public Service and responsible to the Director of Public Service. Within the past few years, several large installations have been made; and through the cooperation of the Street Lighting Engineer and the Traffic Engineer, it is planned that continual progress will be made in the program of Street Lighting modernization particularly at hazardous intersections. The Street Lighting Division employs a staff and a field crew of 31 employees.

Street Maintenance and Improvements

The City Highway Department and the City Engineer's office are responsible for street maintenance and design improvements, respectively. In addition to general street repair, the Highway Department also erects street identification signs. In the matter of cleaning streets, the Traffic Engineering Division cooperates in that its crews will post the NO PARKING signs in order to clear the streets. (Our ordinance does not have a blanket prohibition of parking during the early morning hours.)

The City Engineer's office is responsible for construction design and this year, in addition to a large resurfacing program, is going to supervise the installation of islands at several intersections, and also, redesign some curb radii, at the request of the Traffic Engineer's office. The Side-

Overhead signs and pavement marking aid in the prohibition of turns.

walk Inspector, assigned to the City Engineer's office, also insists that all curb cut requests (with the exception of purely residential driveways) be approved by the Traffic Engineer's office before a permit is issued. All street openings also are inspected to see that they do not unnecessarily interfere with traffic.

Budget

Grand Rapids has long had the distinction of having a low tax rate; and at the present time has next to the lowest tax rate in Michigan for cities over 30,000 population. The total tax rate; city, county and school of $27.210 per $1,000 of valuation, is as follows:

City operating	9.302
City debt	.908
School operating	10.250
School bond	2.000
County operating	4.750
	27.210

The total city budget, including all revenues, for the fiscal year 1951-1952 equals $6,400,623.00. This amount contains $500,000 resulting from a new increased (1½c) State gas and weight tax which must be used for street purposes according to Constitutional provision.

The Traffic Engineering budget has grown considerably over the past few years as can be seen in the following comparative statement of expenditures:

	Actual 1949–50	Budget 1950–51	Budget 1951–52
Traffic Engineering	$ 13,405.65	$ 15,652.00	$ 25,238.00
Traffic Signs and Pavement Markings	26,043.07	30,093.00	42,735.00
Traffic Signals	43,376.30	45,279.00	58,917.00
Parking Meters	18,445.23	13,478.00	22,014.00
	$101,270.25	$104,502.00	$148,904.00

The 1951-1952 budget is further broken down as follows:

	Personal Services	Contractual Services	Commodities	Capital Outlay	Total
Traffic Engineering	$23,348.00	$ 820.00	$ 175.00	$ 895.00	$ 25,238.00
Traffic Signs and Pavement Markings	27,215.00	2,100.00	7,975.00	5,145.00	42,735.00
Traffic Signals	19,564.00	14,600.00	3,775.00	20,978.00	58,917.00
Parking Meters	13,014.00	———	9,000.00	———	22,014.00
	$83,141.00	$17,820.00	$20,925.00	$27,018.00	$148,904.00

Additional items in the general budget dedicated to street expenditures are:

Street Identification Signs	$ 1,500.00
Street Lighting	257,745.00
Channelizations Islands	4,350.00
Street Reconstruction	200,000.00

From reviewing the above, it can be seen that as yet a large proportion of the Traffic Engineering budget (68%) is being used for salaries, but the Division is constantly striving for a capital improvement program based on long-range needs.

In many organizations, particularly those dealing with people, and especially with traffic, accomplishments come slow and with a great deal of work; nevertheless, over the past two years the Traffic Engineer's office has had the opportunity of seeing many of its suggestions and recommendations culminate in successful action.

Public Relations

The two daily Grand Rapids newspapers, the several radio stations, and the television station have been most cooperative in explaining the why's and wherefore's of many improvements just prior to their final adoption on the street itself. Because of the wide coverage of the newspapers throughout the city and the metropolitan area, the public in general is aware of recommendations or prohibitions, as the particular case may be; and although few complimentary letters are received, the number of letters of complaint are greatly lessened.

The Traffic Engineering Division is personally represented on the following local groups:

1. Railroad Relocation Committee
2. Expressway Committee
3. Greater Grand Rapids Safety Council
4. Grand Rapids Traffic Squad
5. Chamber of Commerce's Good Roads Committee

The Division also had representation on panel discussions at the

1. 1949 National Safety Council meeting at Chicago
2. 1950 Michigan Safety Conference meeting at Detroit
3. 1951 Michigan Safety Conference meeting at Grand Rapids
4. 1951 Midwest Regional I.M.S.A. meeting at Indianapolis

In addition, in order to further the knowledge of the workings and responsibilities of the Division, numerous talks have been given to various business, neighborhood and service organizations.

Important Accomplishments

1. The adoption of a long-range major through-street system embodying the use of one-way streets in cooperation with the City Planning Director and the City Engineer. Within the past year, two pairs of streets totaling three miles already have been put in operation.
2. The adoption of a revised Traffic Ordinance conforming

(as much as Michigan law will permit) to the recommendations of the Model Traffic Ordinance. The preparation of the Ordinance involved weekly meetings over a period of eight months at which there was in constant attendance the Superintendent of Police, the Police Traffic Inspector, the City Attorney assigned to the Traffic Court and the Traffic Engineer. This Ordinance was judged first for cities of 100-200,000 population in the "1950 Annual Inventory of Traffic Safety Activities."

3. The reduction of accidents by approximately 60% in one year at what was considered the City's most hazardous intersection by means of proper signalization combined with channelization.
4. The elimination of parking, particularly during the evening peak hours, along the major arterials leading into the central business district.
5. The adoption of the "Uniform Manual" as its specifications and warrants concerning signs and markings and signals.
6. The erection of 24" x 36" posters carrying appropriate seasonal messages at the 30 major routes leading into the City. The posters are supplied by the Greater Grand Rapids Safety Council.
7. The preparation of a program to be used in the near future to instruct drivers of municipally-owned vehicles with regard to accident-prevention.
8. The elimination of left-turns at all signalized intersections on the major and most heavily travelled state highway in order to both reduce accidents and also increase the capacity of the roadway.
9. The presentation of the duties and responsibilities of the Traffic Engineering Division to police recruits attending an in-service training course.
10. The opportunity to serve as liason officer between the management of the local transit companies and the administration.
11. The employment of an adult school crossing guard and the anticipated hiring of at least six additional guards during the coming school year to be stationed at the most hazardous school crossings—determined after a careful survey was made of over 59 such crossings.
12. The assistance which was given to the Municipal Automobile Parking Authority with regard to several parking surveys conducted to determine if off-street lots were warranted at several neighborhood shopping areas.
13. The elimination of several four-way stop sign installations by either the erection of traffic signals (where they were warranted) or by conversion to two-way stop installations.
14. The continuous striving to eliminate angle parking, so that it is now almost non-existent on major through streets.

Future Plans

1. Construction of a long-needed high-level bridge over the Grand River adjacent to the central business district with approach roadways leading to an existing one-way system to the north, and to an improved highway to the south to serve not only through vehicles, but as the major north-south truck route.
2. Further extension of the one-way streets, in order to continuously increase the circulation and capacity of the existing street facilities.
3. Relocation of railroad facilities now located at grade, from the central business district to other outlying areas in order to decrease the mutual conflicts and accidents presently encountered, now resulting from continuous railroad switching operations.
4. A continuous maintenance program with regard to traffic signs and signals.
5. Adoption of a capital improvement program by the city administration so that properties can be acquired and physical changes may be made to the existing street pattern.
6. Inauguration of a periodic motor-vehicle inspection program at a state, county or local level.
7. Preparation of a special-assessment program which will enable merchants in shopping areas to acquire off-street parking areas at a nominal cost; which in turn, do not have to be self-supporting from a revenue standpoint.

It is hoped that the above plans will be materialized as rapidly as those which have already been accomplished, and it is the feeling of the Division that in addition to the vitally important 3 E's, it is also necessary to have the 3 C's of Cooperation, Coordination and Confidence.

Maryland Road Test To Be Extended

The Western Association of State Highway Officials will soon undertake a test program on Bituminous pavements in the far west, patterned after recent tests in the east (Maryland) on concrete pavements. The tests are being conducted to determine the effect of various heavy traffic (axle loadings) on the pavements.

A special section of road, 2,200 meters long, will be built for the bituminous pavement tests in an area most representative of the climatic and soil conditions found in the western part of the United States. Six types of bituminous pavements built according to different specifications will be used. The roadway will be tested with increasingly heavier truck loads applied over a four-to-six-month period. Trucks used will conform to the tractor-trailer type instead of the shorter, single units used in the Maryland tests. Funds for the project will be provided by W.A.S.H.O. and the Highway Research Board will obtain contributions of personnel, equipment, materials or funds provided by the trucking and petroleum industries, the Bureau of Public Roads and the Department of Defense.

Mexico Completes First of Four Express Highways

Mexico has just completed the four-lane, 48-kilometer Guadalajara-Chapala Highway, the first of four express-type highways scheduled for completion this year. The new road connects the City of Guadalajara with Chapala, a summer resort and agricultural center on the Lake Chapala. Maximum grades on the highway are 4 per cent and maximum curvature 8 degrees.

A Study Plan Of Commercial Vehicle Operations In Urban Areas

By Charles A. Goodwin (Jun. Mem., ITE)
Director, Traffic Safety Bureau, Liberty Mutual Insurance Companies, Boston, Massachusetts

"Over 8 million, or 18%, of the total motor vehicles operating in the United States, are represented by trucks." In itself, this statement is of little significance. However, when it is further disclosed: that over 80% of freight transported less than 100 miles is hauled by trucks; that at least one-third of all retail purchases are delivered by truck from department store to home; and that truck registration has increased approximately 50% since 1941, then the ratio of trucks to total motor vehicles becomes worthy of serious reflection.

In recent years, considerable discussion has been promulgated relative to truck congestion in urban areas, with sound remedial controls suggested by traffic engineers and others familiar with the problems.

These recommendations cover nearly all phases of the truck congestion problem and include:

1. Establishment, design and improved use of curb, alley and off-street loading facilities.
2. Principles of zoning for off-street truck loading facilities.
3. Equitable methods of imposing time limits and space restrictions for loading operations.
4. Procedures for routing non-stop commercial vehicles through or around urban areas.
5. Guides and specifications for traffic operational efficiency of consolidated freight terminals or individual carrier transfer terminals.
6. Definition of responsible action and good operational practices by motor carriers, shippers, consignees, enforcement, planning and administrative officials.

Forearmed with these remedial tools, municipal officials responsible for maintaining a reasonable balance of space usage and accessibility for traffic units, are better able to cope with their city truck congestion problems. However, there yet remains the need for a yardstick to measure the *degree to which corrective measures should be applied.*

In recognition of the variable conditions that exist in each city, and in fairness to the various interests involved, local truck congestion problems must be faced squarely and impartially. It is of the utmost importance, therefore, that factual studies be conducted to determine the needs of all parties concerned *previous* to the establishment of regulations. The preparatory steps, general procedures and analysis to be followed in a study of commercial vehicle operations are similar in many respects to the more common "parking" study.

The following is intended to present those factors which should be given consideration in conducting a truck study. Such a study could easily be incorporated as part of an overall parking survey, or be carried out as a separate project. The scope of the study could either embrace all districts of a city in which commercial vehicles operate, or could be confined to an area of concentrated pickup and delivery.

Evaluate Truck Movement

Of primary consideration is the measurement of the concentration characteristics of commercial vehicles and the load they impose upon the city streets:

1. Use all available data secured in *origin and destination studies* conducted under State, County or Municipal Authority. The O-D survey will contain valuable information on the amount and type of traffic using State and Local main arteries leading into and out of central business or other congested districts.
2. Conduct a *cordon count* of all commercial vehicles, classifying trucks according to the number of axles or as single-unit, semi-trailer or full trailer. Best results can be obtained if trucks are counted and classified for 10-12 hours by ½-hour intervals on Tuesday and Thursday (usual days of peak operation.)

   For a large-scale survey the establishment of cordon count stations along both an *outer* and an *inner* cordon line is advisable. The *outer* cordon line could enclose the entire city area, with control stations at all major points of entry and exit; thus a valuable measure of through truck movement can be obtained. The *inner* cordon line should form a boundary around the concentrated district or area selected for special study, with counting stations located at points where the cordon crosses each street. An accurate measure can then be obtained of the volume, types, and accumulation characteristics of all commercial vehicles moving into and out of the inner cordon area.
3. Obtain *Speed and Delay* data on those main arteries and central business streets where truck operations are heaviest, thus determining the average amount of time spent in motion on the routes together with the amount, causes, locations, durations and frequency of delays encountered while in motion during peak and off-peak hours.

   The actual riding check method is recommended for observing speed and delay on main arterial routes which carry commercial vehicles into and out of the city. The flexibility of this method will permit the following and approximating of any commercial vehicle movement over the entire route selected. The *Traffic*

*Engineering Handbook** recommends at least 8 to 12 "runs" per route to assure reasonable accuracy in test results. In the Central Business District the method of elevated observations is preferable. This method permits observers stationed at elevated vantage points to spot selected vehicles and follow their speed and delay progress over a defined section of street.

Determine Motor Carrier Operational Practices

Motor carriers operating within the city limits either from local terminals or outside origins should be requested to furnish the following information on *daily* operations:

1. Total inbound freight volume and the percentage delivered locally the same day.
2. Total outbound freight volume picked up in city area.
3. Number, type and length of local delivery and pickup trucks.
4. Average number of stops and approximate routing schedule for delivery or pickup, per truck.
5. Location by zone and street of *regular* receivers and shippers serviced by the motor carrier.
6. Average amount and distribution of time required *per truck* for delivery and/or pickup of freight.
7. Average city mileage per truck.
8. Details of any planned scheme established by carriers for routing over-the-road or local trucks in order to avoid hazardous and congested points or for safe routing of vehicles carrying explosives and inflammables.
9. Special operational problems.

Determine Operational Practices of Merchants

Business concerns receiving and shipping goods each day via their own company trucks, local carriers or outside carriers can provide a wealth of daily operational information for an urban truck study, including:

1. Number, type and size of commercial vehicles servicing each establishment *per tenant*.
2. Time and duration of delivery and/or pickup operations.
3. Average number of shipments handled per commercial vehicle.
4. Average weight and number of pieces per shipment handled in or out.
5. Type, size and location of loading and unloading facilities: curb, alley or interior block.
6. Special conflicts, delays, et cetera occurring daily as the result of physical limitations and inadequacies, improper enforcement, and other space abuses.

Spot Check Loading Space Usage

Within an established inner cordon a detailed study by 15-20 minute time intervals should be made at sample critical locations to determine loading and unloading practices of all interests involved, and including:

1. Existing loading time and space restrictions adjacent to establishments serviced.
2. Number, location and duration of loading and unloading operations by commercial vehicle types.
3. Truck parking violations as double parked, angle parked, parked at hydrant, bus stop or on sidewalk.
4. Delays due to handling inefficiencies, inadequate facilities, personnel shortage, lack of time limits, traffic blocks, illegal parking of passenger cars in designated commercial loading zones, alleys or off-street areas, et cetera.

Analysis of Survey Data

The collection and analysis of the survey data should automatically provide municipal officials with the desired measuring stick for applying proven remedial controls proportionate to their local problem. Truck traffic in the urban area can be evaluated according to origin and destination thus permitting the establishment of through-truck routes on the edges of the central business districts as distinguished from service routes for local delivery and pickup.

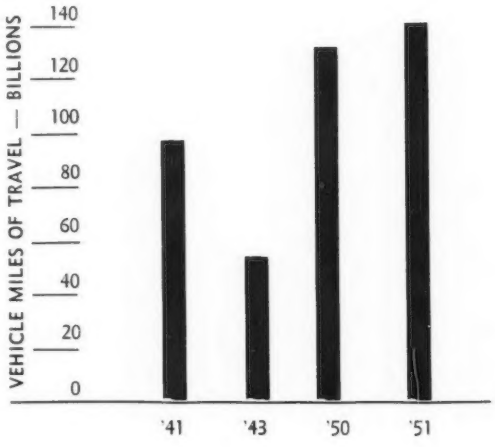
A routing plan, if practical and in conformity with existing needs, should draw forth the complete cooperation of the motor carriers provided that:

1. A Truck Route ordinance specifically defines by schedule those streets upon which heavy commercial vehicles are prohibited and/or permitted to travel.
2. All truck routes are clearly marked by the posting of designation signs at junction points and points of entry.
3. Capacities of overloaded streets *subjected to heavy commercial vehicle travel*, are improved by channelization, one-way movements, parking elimination and other measures.

The more intense congestion problems characteristic of concentrated areas of delivery and pickup cannot be eliminated by guess-work, prejudice or pressuring. Only a planned factual and impartial study will provide the *positive measure* for equitable application of penalties, benefits, controls and regulations.

*Traffic Engineering Handbook Editorial Board, Henry K. Evans, editor, *Traffic Engineering Handbook*, second edition, 1950, Institute of Traffic Engineers, New Haven, Connecticut.

Traffic Trends



TRAVEL ON RURAL ROADS FOR FIRST SEVEN MONTHS of 1941, 1943, 1950 and 1951.

Based on Bureau of Public Roads Data

Effect Of Shoulder Parking On Vehicle Operation

By Robert C. O'Connell
Traffic Engineer, Wyoming Highway Department, Cheyenne, Wyoming

NARROW shoulders reduce the effective width of a traffic lane by causing vehicles to travel nearer the center of the pavement. The same effect will be produced on traffic by a disabled vehicle that is unable to park clear of the traffic lane. According to studies made by the Bureau of Public Roads, this type of roadside hazard occurs on the average of at least once every 10,000 vehicle miles.

Passage around an obstacle either stationary or moving, forces the driver to make a maneuver which will be the normal transition path if the driver is not influenced by some other vehicle. Very little factual information is known about this type of maneuver; in particular, the length of the maneuver called the transition distance. The modern road designer is confronted with conflicting statements relative to the proper length of transition.

It is believed that speed and placement are not the only important factors in determining the transition path; this study is an analysis of the characteristic traits of drivers as they approach a car parked on the shoulder of the road and transition away from it on both a two- and four-lane road during daylight conditions.

Description of Areas

In making comparisons it was necessary to keep similar as many conditions as possible such as weather, sight distance, type of traffic, alignment, grades, surface type, effective shoulder width and roadside hazards. Sites were selected that appeared to be a very normal section of straight road that would not require any unusual decisions on the part of the driver; so that, when he realized the hazard of the parked car, he could comfortably adjust his path to allow a distance which, in his mind, is sufficient for clearance of this hazard.

The location for the study of a four-lane road was on U. S. Route No. 1 west of New Haven, Connecticut, and a two-lane road northwest of New Haven on Connecticut Route No. 69 towards Waterbury.

Field Procedure

The data were recorder on an Esterline Angus 20-pen recorder. Eleven of the pens recorded placement and one pen recorded the speed of the vehicle. Placement was recorded by observers noting the distance the right front wheel was from the edge of the pavement and calling it into the operator of the recorder. A centrally located observer recorded speeds by means of a contact key that was wired into the recorder with a long extension wire. It was essential that the five man field party be in complete communication with each other and army type field telephones were used for this purpose.

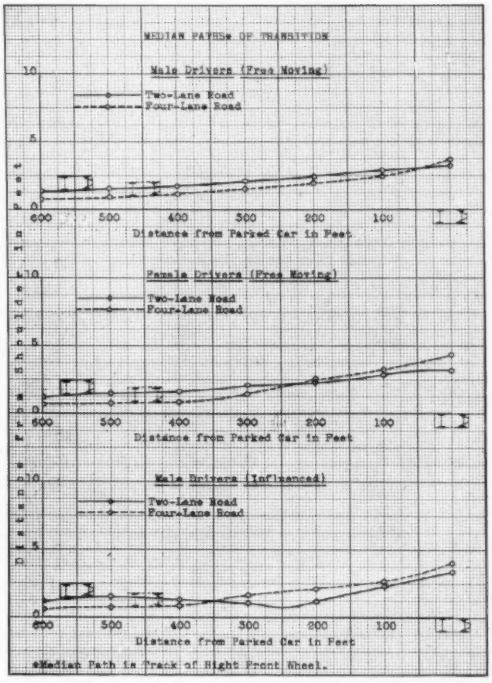


Fig. 1

Vehicles were first recorded 600 feet back from the parked car and then at every 100 foot increment until the study vehicle passed the parked car. The placement was read to the nearest foot by observing white tape markings that incidentally proved to be very satisfactory as a means of marking the pavement.

Speed

The speeds on the four-lane road ranged from a low of 17.8 miles per hour to a high of 54.5 with an average speed of 34.1 miles per hour. In comparison to this the speeds on the two-lane road ranged from 26.0 miles per hour to 62.6, with an indicated average speed of 42.0 miles per hour. These speeds are the average of the overall run and the variation is due to the selection of the sample. The study on the four-lane road did not include the faster

This article is based on Mr. O'Connell's student thesis research while he was a student at the Yale Bureau of Highway Traffic during the academic year 1950-1951.

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drivers in the high speed lane, as they would not indicate a transition path in that lane; however, on the two-lane road all free-moving vehicles were recorded as they were in a single lane which would demand some sort of maneuver.

There were five possible variations of speed developed by the vehicles through the test area and they are shown in Table 1.

Table 1
SPEED VARIATION

Pattern of Speed	Four-lane	Two-lane
Constant Speed	2%	2%
Deceleration	47%	35%
Deceleration followed by Acceleration	11%	6%
Acceleration followed by Deceleration	30%	48%
Acceleration	10%	9%

The similarity of the speed variations on both roads is quite noticeable. Of the drivers on the four-lane road, 77% of them decelerated throughout the run or else decelerated after some acceleration. The similar category on the two-lane road accounted for 83% of the drivers, indicating that the largest percentage of drivers felt that their speed was too fast for conditions with the hazard of the parked car. The modal value of the speed variation for these drivers who decelerated through the area occurred between 2-4 mph range with an average deceleration of 5.2 miles per hour on the four-lane road and 4.9 miles per hour on the two-lane road.

Transition Path

Illustrated in Figure 1 is a comparison of the median paths of male, female, and influenced drivers, an influenced driver being one whose normal transition path was altered by another vehicle, either an oncoming vehicle or one approaching from the rear. The plotted path is the track of the right front wheel, indicated by the diagramatic vehicle, as it approached the parked car also illustrated.

The median paths of the female drivers are quite similar to the median paths of the male driver, the main difference being the wider end clearance allowed by the former. The lower chart on this figure shows a definite distortion of the paths of the influenced drivers, who incidentally were all male drivers. The influence that altered the path of the four-lane road driver was caused by another vehicle that either passed him during the run or else approached him in the high speed lane close enough to influence his movement. The influence that altered the path of the driver on the two-lane road was always caused by an on-coming vehicle in the opposite lane, and this hazard is well illustrated by the bending in of the path on the two-lane road.

Table 2, below shows a brief summary of the median placement values of the right front wheel from the edge of the pavement of all study vehicles, adapted from Figure 1.

The median curves of the normal transition paths of both male and female drivers are shown in Figure 2 by

Table 2
SUMMARY OF PLACEMENT

	Entrance Position			Midway Position			Exit Position		
	Male	Fem.	Infl.	Male	Fem.	Infl.	Male	Fem.	Infl.
Two-lane	1.3	1.2	1.2	2.0	2.1	1.3	3.3	3.4	3.4
Four-lane	0.7	0.7	0.6	1.5	1.5	1.6	3.8	4.5	4.0

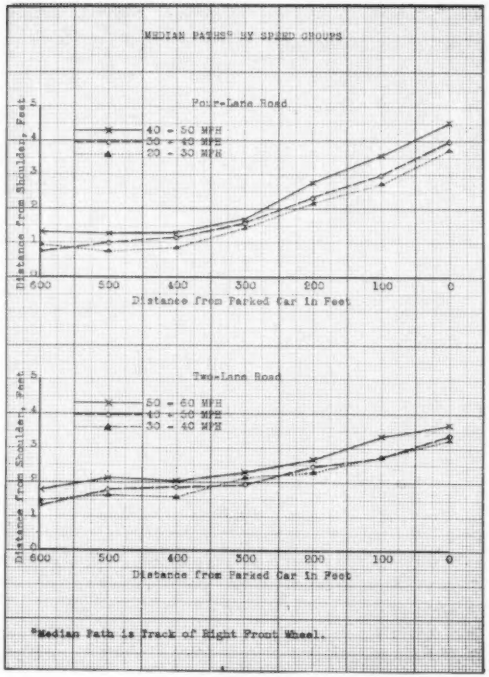
MEDIAN PATHS* BY SPEED GROUPS
Four-Lane Road
40 - 50 MPH
30 - 40 MPH
20 - 30 MPH
Distance from Shoulder, Feet
Distance from Parked Car in Feet
Two-Lane Road
50 - 60 MPH
40 - 50 MPH
30 - 40 MPH
Distance from Shoulder, Feet
Distance from Parked Car in Feet
*Median Path is Track of Right Front Wheel.

Fig. 2

speed groups. The upper half of the figure represents the paths on the four-lane road and the lower half the paths on the two-lane road. These curves are then compared by speed groups of the two- and four-lane road in Figure 3. The only groups that could be compared are the 30-40 and 40-50 miles per hour groups because of the limited samples in the extreme speeds.

Time and Distance Gaps

A gap is defined as the untraveled distance between the parked car and the place where the approaching driver felt that he should begin to adjust his path to allow for extra clearance of the hazard. This gap was measured in time by seconds and distance by feet and shown in Figures 4 and 5 by speed groups. The influenced drivers were not included in these data.

On both the two- and four-lane roads the 50 percentile of distance in feet is a straight vertical line following very close to the 300 foot distance. This means that the average driver began his transition approximately 300 feet from the parked car, with speed having no noticeable effect. It follows then, since the distance is constant in the speed groups, that the time gap will vary proportionately with speeds which is shown in the slanting of the 50 percentile line on the time chart.

Interpretation of Analysis

The median length of transition on the four-lane road was 270 feet and on the two-lane road, 179 feet. If these median transition distances are divided by their respective

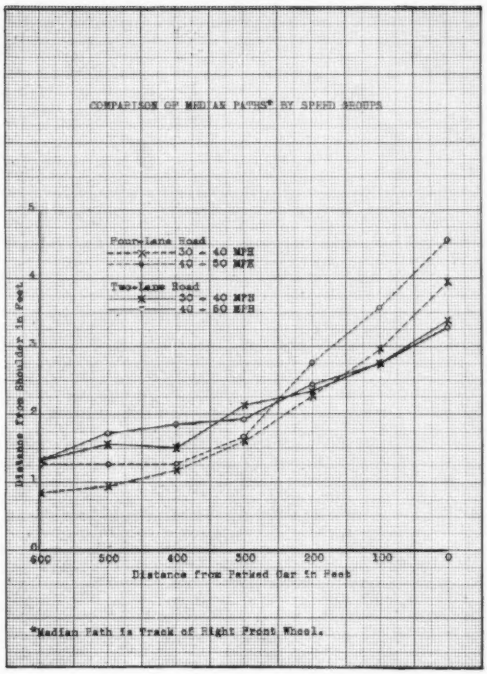
COMPARISON OF MEDIAN PATHS* BY SPEED GROUPS
Four-Lane Road
30 - 40 MPH
40 - 50 MPH
Two-Lane Road
30 - 40 MPH
40 - 50 MPH
Distance From Shoulder in Feet
Distance from Parked Car in Feet
*Median Path in Track of Right Front Wheel.

Fig. 3

median values of lateral displacement, then a ratio will result that illustrates the average amount of lateral displacement per 100 feet of longitudinal distance that the driver moved.

Four Lane	End Position = 3.8 Entrance Position = 0.7	
	Lateral Displacement = 3.1 ÷ 270 = 1.15 feet per 100 ft.	
Two Lane	End Position = 3.3 Entrance Position = 1.3	
	Lateral Displacement = 2.0 ÷ 179 = 1.12 feet per 100 ft.	

It is then seen, that drivers on both the two- and four-lane roads transitioned at nearly the same rate of lateral movement per 100 feet. This fact seems to indicate that in determining any type of transition approach to a hazard or barrier, a rate of lateral movement of approximately 1.2 feet per hundred feet should not be exceeded. If the ratio is proportional to the length of transition (L) and lateral displacement (W), $1.2/100 = W/L$ then $L = 83W$.

In referring to the approach to an obstruction, The American Association of State Highway Officials in the Manual on Uniform Traffic Control Devices states that diagonal marking should be determined by the formula $L = WS$, in which L is the length of transition in feet; W, the width of the obstruction in feet and S, the speed in miles per hour. Again the Association suggests the use of the formula $L = 20W$. A comparison of these rules of thumb for determining transition length with the suggested formula based on the 1.2 feet per 100 feet is shown by Table 3. For the purposes of comparison in this table the speed will be assumed at 60 miles per hour and W equal to 3.8 feet (average exit placement on four-lane road) in the first comparison and 3.3 feet (average exit placement on the two-lane road) in the second comparison.

Table 3
HYPOTHETICAL COMPARISON OF TRANSITION LENGTHS USING VARIOUS FORMULAE

		L=83W	L=WS	L=20W	Median Distance*
Four-Lane	W=3.8 S=60	315'	228'	76'	300'
Two-Lane	W=3.3 S=60	274'	198'	66'	287'

*Median Distance of Initial Influence

both roads. That is, the new transition lengths are nearly identical to the points of initial influence on both roads, which, as stated previously, is the point where lateral movement was first recorded.

The W in the formulas recommended by the American Association of State Highway Officials represents the width of the barrier in feet; while in the suggested formula, ($L = 83W$) W represents the amount of lateral displacement in feet the driver is to be moved from his normal alignment. It is felt that W should be measured in terms of lateral displacement in any of the formulas rather than width of barrier.

It can be seen that the values from the suggested formula developed by this study are somewhat larger than the closest rule of thumb formula values indicating the latter to be quite conservative in determining transition length. The values calculated from the suggested formula agree very closely to the median distance gap of initial influence on

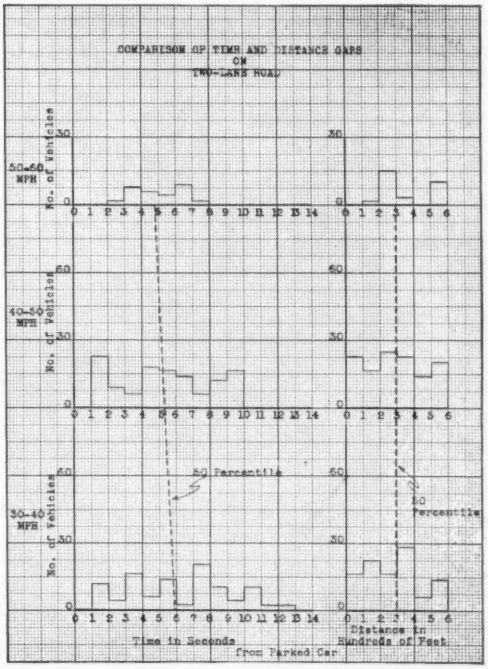

Fig. 4

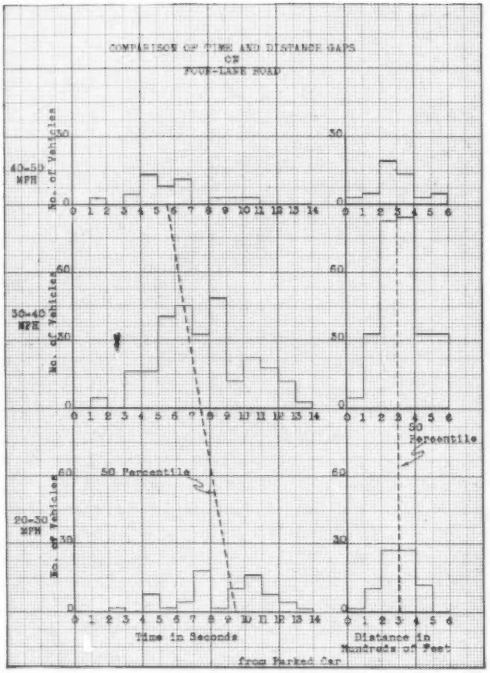

Fig. 5

Conclusions

1. A car parked on the shoulder of the road near the edge of the pavement is a type of hazard that drivers feel must be given an extra clearance for safety. The four-lane road offers the driver a sufficiently wide roadway to select this clearance as he desires when traffic volumes permit. These drivers decelerate as they approach the hazard the same amount as the drivers on the two-lane road; but they choose a longer transition path with wider end clearance. The female driver on the four-lane road is more cautious than the male driver and uses the extra lane quite freely in her maneuvers.
2. The drivers on the two-lane road in their maneuver for desirable clearance of the parked car follow a path of transition that appears to be restricted by the center-line of the road. The transition length is shorter and the end clearance is less than that of the drivers on the wider four-lane road, and an opposing vehicle will cause an influence that is sufficient to completely change the proposed transition path. The female driver on the two-lane road is very similar in all characteristics to the male driver on the same road.
3. The drivers on two- and four-lane roads follow transition paths of varying length and lateral displacement. Yet, these same varying movements have one constant condition and that is the rate per 100 feet of transition that they are laterally displaced. Based upon this fact is the development of a new formula suggested to be used for determining length of transition. The formula, $L = 8\frac{1}{3}W$, gives the length of transition required in feet where W is the amount of lateral displacement in feet measured from the normal alignment.

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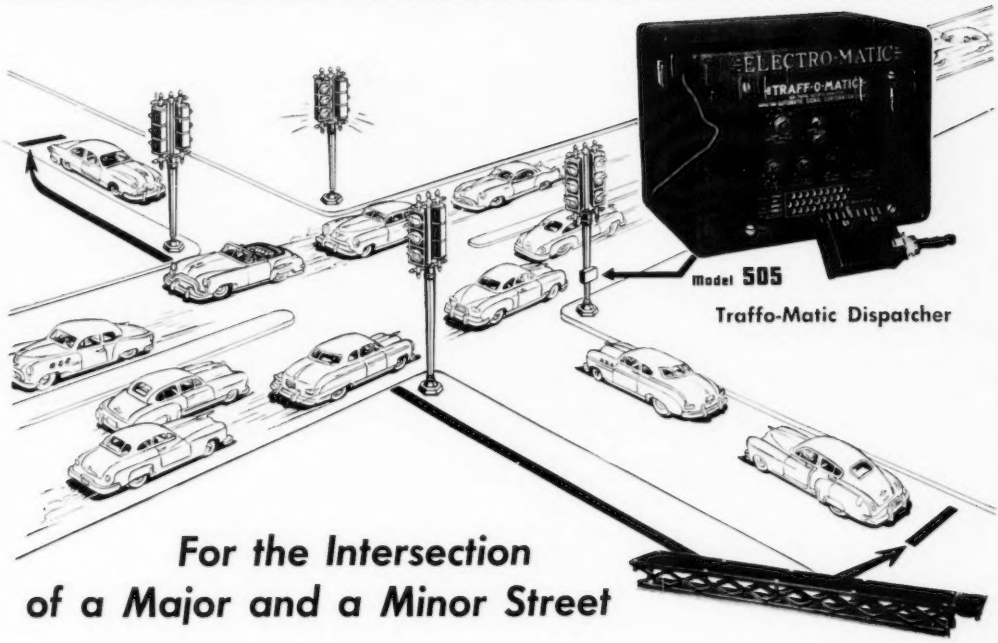

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Open Discussion

By Bryan Wilson (Mem., ITE)
Engineer of Safety, Traffic Department
State Highway Commission of Kansas
Topeka, Kansas

Are Rural Speed Zones Effective?

THE zoning of sections of rural highways for speeds compatible with conditions of horizontal and vertical alignment and roadside developments seems not only a reasonable, but an economical technique. Its status as a traffic control measure seems firmly established in most states.

In Kansas, however, there is a wide-spread belief among engineers of other departments in the State Highway Commission that the installation of speed zones, regardless of the stated speeds, is a waste of both time and signs. This belief is also shared by a few citizens. Doubtless there are engineers and people in other states who tend to this belief, especially those not connected with Traffic or Safety departments.

It is an engineering trait acceptable to most of us that opinions are more or less meaningless, but that factual evidence cannot be ignored.

The Facts As We Find Them

The total number of rural speed zones in Kansas amounts to sixty-five (including those in unincorporated towns). The lengths of these zones range from one-quarter of a mile to seven miles. These zones are signed for speeds of from 35 to 55 miles per hour, with 90% under 45 M.P.H.

Two methods were used to determine the speeds of the zones: 1. The 85 percentile, and 2. The Outside, or Public Pressure methods. The latter method prevails on sections of the highway adjacent to Military or Naval bases, and ordnance plants under military control.

A Bit of Factual Data on Our Zones

We have made quite a number of speed checks on the various speed zones over the state in order to see just what is happening in the way of observance or nonobservance to the posted speeds. We have used Electromatic equipment and Enoscopes in these tests. To keep this article fairly brief, the following two samples which are typical of our tests are given:

1. *A 35 mile per hour speed zone adjacent to a Naval Base.* Length—one-half mile. Perfect alignment—tangent road, two-lane—unobstructed sight distance—no intersection except with the main entrance to the Base.

Result of test: 85% of the 370 vehicles checked were traveling under 57.4 miles per hour. 30% under 35 miles per hour.

2. *A city-approach zone adjacent to a large city.* This zone consists in reality of two zones, the one ending at the city limits being a 35 M.P.H. zone, the other a 55 M.P.H. zone. The length of the former is one-quarter of a mile; the latter, six miles. It has perfect alignment horizontally, and vertical alignment not to exceed 4% grades. It is a four-lane highway with medial divider to separate opposing traffic although there are numerous intersections at grade with poor sight distance.

Result of test: 85% of traffic traveling under 73.2 miles per hour. 33% under 55 miles per hour. No visible difference in speeds in the 35 M.P.H. zone except within 500 feet of the city limit.

Do not these tests tend to prove that rural speed zones are ineffective? Do not these tests support the opponents of speed zones?

The Purpose of Speed Zones

Before attempting to answer these questions, the reason speed zoning is installed should be considered. The basic purpose of speed zoning is to prevent accidents.

Accident Records Tell the Story

Accident record for zone No. 1:

One year before: 14 accidents—4 injuries, 10 property damage.

One year after: No accidents.

Accident record for zone No. 2:

One year before: 73 accidents—13 fatal, 27 injury, 33 property damage.

One year after: No accidents.

Six years after: 3 property damage.

In Answer to the Questions

1. The mere installation of a speed zone, regardless of the posted speed, will have little or no effect in the reduction of speeds. (Note: This presumption is based on little or no enforcement of speed zones.)

2. The installation of a speed zone, regardless of posted speeds, will reduce accidents.

3. (a) The fact a driver is knowingly violating prima facie speeds makes him more alert, and therefore better able to control his car to avoid the necessity of emergency actions.

(b) When, by the use of any traffic technique, drivers can be alerted to their surroundings the basic problem of accident prevention is at least 95% accomplished, because accidents seldom happen to alert drivers.

4. In summary, if kept within reason, speed zones are well worth the time and money spent on their establishment, because they are effective in the reduction and prevention of accidents.

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12 THE DENVER POST: FRIDAY, JUNE 29, 1951

City to Buy 4,000 Parking Meters

A committee of city officials decided Friday noon to accept the bid of the Duncan Meter company of Chicago to supply the city with 4,000 new parking meters at a cost of $205,800.

The Duncan bid was $600 higher than the offer submitted by a company of Oklahoma City, but Traffic Engineer Henry A. Barnes estimated that over the life of the meters, it would cost his department $100,000 to wind the other meter by hand. The Duncan meters are self-winding. The highest bid on the meters was $232,000, submitted by a meter company of Canton, Ohio.

The Duncan meters are the type with a glass dome now in use on many downtown streets. The 4,000 new meters, said Barnes, will be used to replace all of the city's old crank-operated type meters.

The decision to buy the Duncan meter was unanimous by the city's parking meter committee.

*Trial order of 225 in 1948; 1310 more added in 1949.

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TRAFFIC NEWS

400 Attend ITE Annual Meeting

The 22nd Annual Meeting of the Institute of Traffic Engineers, held at the Ambassador Hotel, Los Angeles, was attended by more than 400 street and highway officials and their wives. Delegates gathered from all parts of the United States and Canada to attend the Meeting.

The Annual Business Meeting held on Monday was well attended by members of all grades. The annual reports of officers and committee chairmen were given at this meeting, and the important matters discussed will be recorded in later issues of "Traffic Engineering" and in other communications with the membership. Meetings of the Board of Direction were held on Sunday and Tuesday.

The General Assembly was opened on Tuesday morning by addresses of welcome to the delegates made by Honorable Fletcher Bowron, Mayor of Los Angeles; Roger W. Jessup, Chairman, Los Angeles County Board of Supervisors; and Oscar A. Trippet, President, Los Angeles Chamber of Commerce. In response to the welcome, newly elected President of the *Institute*, Nathan Cherniack, Transportation Economist, The Port of New York Authority, called attention to the fact that this is the first time that the *Institute* has held its annual meeting west of the midwest area, and complimented the west coast for its progressive attitude toward traffic improvements.

Mr. Wilbur S. Smith, Associate Director, Yale Bureau of Highway Traffic, was the Chairman of Technical Session No. 1 which was opened with a paper by William H. Parker, Chief of Los Angeles Police Department. Chief Parker urged better cooperation between enforcement and engineering. He stated that the end purpose of both the traffic engineer and traffic police is identical, and while the tools of the trade may differ, the goal is a common one.

Chief Parker was followed by James A. Pryde, Chief, Washington State Patrol, who stressed the need for carefully planned traffic enforcement. He described enforcement as a vital part of our government intended to be the servant of the people, and not their master. It was stressed that traffic control will not be effected by the traffic ticket alone, and that engineering and education are the long-range answer and the best way.

The final paper of the first session was presented by Robert S. Holmes, Deputy Director, Engineering Services Division, Federal Civil Defense Administration. Mr. Holmes reviewed the probable devastating effects of an atom bomb attack and the importance of transportation in the entire civil defense

[1] The new Board of Direction in an informal pose following the Annual Banquet. left to right: Harry E. Neal, immediate past President; Director Thomas E. Willier; Secretary-Treasurer Harry Porter Jr.; Vice-President F. B. Crandall; President Nathan Cherniack; new Director J. Edward Johnson; and Directors Joseph L. Wehmeyer and F. M. Carter. Vice-President Donald M. McNeil and new Directors John B. Ecker and Theodore M. Matson were not present.

[2] The welcome to delegates at the beginning of the Technical Sessions. Left to right: Roger W. Jessup, Los Angeles County Board of Supervisors; Hon. Fletcher Bowron, Mayor of Los Angeles; President Cherniack and at the rostrum Oscar A. Trippet, Los Angeles Chamber of Commerce.

[3] Immediate past President Harry Neal holds past Presidents' certificate while being congratulated by President Cherniack.

[4] The Past Presidents' Award for outstanding achievement in Traffic Engineering was won by Carlton C. Robinson. Past President Wilbur Smith is shown congratulating Mr. Robinson (right). Seated is Director F. M. Carter who was master of ceremonies for the annual banquet.

program. He urged the traffic engineer to volunteer his services to the local civil defense organization so he can assist in the planning and development of the best possible traffic circulation plan for his community in the case of an attack.

Technical Session No. 2 was held the following afternoon with Roy E. Jorgensen presiding. Mr. Jorgensen, Engineering Counsel, National Highway Users Conference, formerly was the Chief Engineer of the Connecticut State Highway Department.

The first speaker of this session was Mr. Paul F. Croley, Assistant Executive Director, Philadelphia City Planning Commission. Mr. Croley described the Philadelphia-Camden Traffic Survey, its analysis and the use of the results for the planning of a number of important facilities within the area studied. His paper concluded that the survey is of great value, and the expenditure for it has been well justified.

The next paper was delivered by Edward T. Telford, Engineer of Design, California Division of Highways, who discussed the relation between highways and the business community. Mr. Telford concluded that the business community includes the entire economy of the nation which is dependent upon communications and transportation. He urged adequate highways with freeway construction where it is warranted. A summary of the effect of freeway by-passes on retail business volume indicated beneficial effects of the by-passes on business. Studies of the influence of frontage roads on business also indicated that the advantages ordinarily exceed the detriments of some circuity of travel imposed by frontage roads.

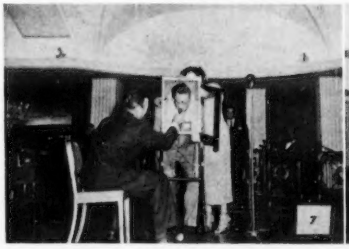
Mr. Telford was followed by William R. McConochie, Chief of Traffic and Transportation Section, De Leuw, Cather and Company, who presented some of the current problems of the mass transit industry. Mr. McConochie stated that there frequently is a conflict of interests between transit managements trying to make a profit and city officials endeavoring to coordinate all modes of transportation. For example, he pointed out that transit management is interested in promoting off-peak business when city officials would like more people to ride busses during the traffic peaks—at a loss to mass transit income. Other mass transit problems and relief measures such as, tax reductions, support of labor, enforcement and traffic engineering were reviewed. Mr. McConochie suggested a universal plan for every city as follows: "Call on transit companies to carry a bigger share of the rush hour load, and then make their enthusiastic cooperation financially feasible."

The final paper of this session was a description of the planning studies for the Delaware Memorial Bridge presented by Mr. William J. Miller Jr., Traffic and Planning Engineer, State of Delaware. Mr. Miller also discussed the financing of the bridge, its design, and special overhead destination signs to be installed on the bridge approaches.

Technical Session No. 3 was dedicated to traffic engineering education and research. Mr. Joseph L. Wehmeyer, Safety and Traffic Engineer, Board of Wayne County Road Commissioners, Michigan, presided during this session.

The first paper of this session by J. C. Young, Principal Highway Engineer, California Division of Highways, was on the subject of professional registration of traffic engineers. Mr. Young summarized the results of a questionnaire sent to *Institute* members concerning their registration status and the registration requirements of different states. The results revealed that 49.5% of the membership is registered in some branch of engineering. Further, there are apparently only nine states that do not now recognize traffic engineering experience as a qualifying experience toward registration. Mr. Young concluded by warning that mere membership in the *Institute* should not constitute eligibility for registration as an engineer, traffic or otherwise.

Mr. Young was followed by Donald S. Berry, Assistant Director, Institute of Transportation and Traffic Engineering, University of California, who presented a paper on civil service requirements and the extent of traffic engineering training being provided in colleges. The paper reported the results of an extensive investigation of current practices in traffic training and employment. Mr. Berry stated that professional traffic engineers should have sufficient training in one of the basic engineering fields to



[5] The Western Section elected Officers at its annual meeting during the Convention. From left to right: past Secretary-Treasurer J. Al Head; past President Fred T. Fowler; President Joseph E. Havenner; Secretary-Treasurer Donald S. Berry and Vice-President Herbert C. Higgins.

[6] Master of ceremonies, "Nick" Carter presents the winning ticket to "Lucky Lady" Mrs. Kenneth S. Vaughan-Birch, winner of the television set. Mr. Vaughan-Birch appears very pleased while President Cherniack looks on approvingly.

[7] Burton Marsh takes "one last puff" offered by Laurence A. Kane before the "guillotine falls." Professional entertainers are shown in the background.

[8] Important national affairs were mis-administered at the Biscuit Banter Breakfast. Phineas P. Wafflebottom III is shown receiving a complaint with the assistance of his staff. Left to right—Ralph B. Luckenbach; D. J. Faustman (standing); Guy D. McDonald; D. Grant Mickle; Ross T. Shoaf; Lloyd M. Braff; and Paul Plutae. Clifford C. Clark is standing at the doorway waiting to deliver an "urgent" message.

permit registration as a professional engineer, and that it is not practicable or desirable to provide intensive specialization in traffic engineering as part of the undergraduate curriculum. He added that additional graduate fellowship will increase the number of men given special training each year. Increased in-service training was urged. Mr. Berry further stated that in many cities there are no grades of traffic engineering suited to the engineer just graduated from the four-year curriculum. He concluded that more study is needed of civil service job classifications to determine the feasibility of correcting this condition, and of improving the traffic engineering portions of civil service examinations.

Mr. Berry was followed by Mr. Harmer E. Davis, Director, Institute of Transportation and Traffic Engineering, University of California, on the education and research program of the Institute of Transportation and Traffic Engineering. Mr. Davis traced the development of the Institute of Transportation and described its program of training, research and services as an information center. The objectives of the Institute of Transportation and Traffic Engineering were summarized by Mr. Davis as follows: to develop new information and analytical procedures, and to contribute in the development of future leaders in transportation.

Pedestrian Interval Acceptance was the subject of the next paper presented by Mr. Carlton C. Robinson, Assistant Traffic Engineer, Bureau of Traffic and Transportation, City of Portland, Oregon. Mr. Robinson received the *1952 Past Presidents' Award for Achievement in Traffic Engineering* for the original research reported in this paper. His paper described a study of the time intervals in traffic required by pedestrians crossing a 37 foot wide one-way street and a 44 foot wide two-way street. It was found that a pedestrian will accept a considerably smaller interval on a one-way street. Contrary to popular opinion, it was also found that the length of interval accepted by pedestrians does not decrease with increased waiting time. Mr. Robinson's study indicated decreased pedestrian delay on one-way streets and increased delay for pedestrians and vehicles alike following the installation of a traffic signal.

The final paper of this session was presented by Dr. T. W. Forbes, Visiting Associate Professor of Engineering and Psychology, University of California at Los Angeles. His paper reported the results of a study of speed, headway and volume relationships on a six-lane divided freeway. He stated that the faster lanes (toward the center of the highway) showed less tendency to approach a maximum volume than the slower outer lanes, and the center lane carried the highest volume at the highest average speed. Comparing time headways in the three lanes, Dr. Forbes found shorter headways in the high speed lanes which led to the conclusion that psychological factors in the case of three lane one-way operations were of greater influence in the determination of speed and headways than a direct relationship between speed and volume.

Mr. F. B. Crandall, Traffic Engineer, Oregon State Highway Department, was Chairman of Technical Session No. 4. Mr. Henry A. Barnes, Director, Traffic Engineering Division, City of Denver, delivered the first paper of the session on the modern signal system being installed in Denver. The system, stated Mr. Barnes, utilizes traffic actuated cycle selector master equipment with fixed time synchronous motor driven secondary controllers. The master will automatically select any one of six cycle lengths from traffic information received at eight sampling points. He further stated that the motors to operate the controllers are placed in a central control room with the camshaft mechanisms located at each intersection. Mr. Barnes reported that the entire system will be in operation as soon after Thanksgiving this year as possible.

During the next period, Mr. D. Grant Mickle, Director, Traffic Engineering Division, Automotive Safety Foundation, and Mr. Alger F. Malo, City Traffic Engineer, Traffic Engineering Bureau, Detroit, presented papers on transportation administration in the City of Detroit. Mr. Mickle reviewed the history of the Detroit Traffic Engineering Bureau and its current operations. He also discussed the Charter amendment creating a Department of Streets and Traffic approved for submission by the Common Council of Detroit in September, 1951, and described the general powers of the four-man commission heading the department. Mr. Malo reviewed the legal basis for Detroit's street operations and the functions of the new department.

The final period of the session was devoted to a debate on "Is Traffic Engineering Keeping Pace." Sidney J. Williams, Assistant to the President, National Safety Council, was moderator for this debate. The affirmative side was presented by Burton W. Marsh, Director, Traffic Engineering & Safety, American Automobile Association, and Ross T. Shoaf, Traffic Engineer, Office of City Engineer, San Francisco, and the negative by Thomas J. Seburn, City Traffic Engineer, Kansas City, Missouri, and T. T. Wiley, Deputy Commissioner, Dept. of Traffic, New York. The debate aroused great interest and was continued by individual groups long after the session was closed.

F. M. Carter, Assistant Traffic Engineer, California Division of Highways, was Chairman of Technical Session No. 5. Ralph T. Dorsey, Traffic Engineer, City of Los Angeles, opened this session with his paper on off-center traffic movement in Los Angeles. Mr. Dorsey explained that off-center operation is used on major thoroughfares where one-way traffic is not practical. He related the favorable experience after adoption of off-center flow on a number of streets. "For example," he pointed out, "through traffic concentration on Wilshire Boulevard by westbound traffic resulted in a volume of 3,000 vehicles in the peak hour against 1,200 prior to the use of the off-center principle." A film showing the methods used in the placement of off-center markers was then shown.

Mr. Dorsey was followed by Mr. Guy D. McDonald, Traffic Engineer, Los Angeles County Road Department. Mr. McDonald reviewed the traffic problem of Los Angeles County and discussed the responsibilities and operations of the County Road Department. In conclusion, he stressed the need for traffic engineers to "fight to the last drop" for uniform practices and procedures.

The final paper of the Technical Sessions was presented by Mr. P. O. Harding, Assistant State Highway Engineer in charge of Los Angeles District Office. Mr. Harding reviewed the highway improvements existing and planned in the Los Angeles area. He particularly described the freeway system and discussed a number of very interesting slides showing scenes of the various freeways to be visited during the afternoon field trip.

The convention was officially closed by President Cherniack following presentation of the Convention Resolutions by J. C. Young, Chairman of the Reso-

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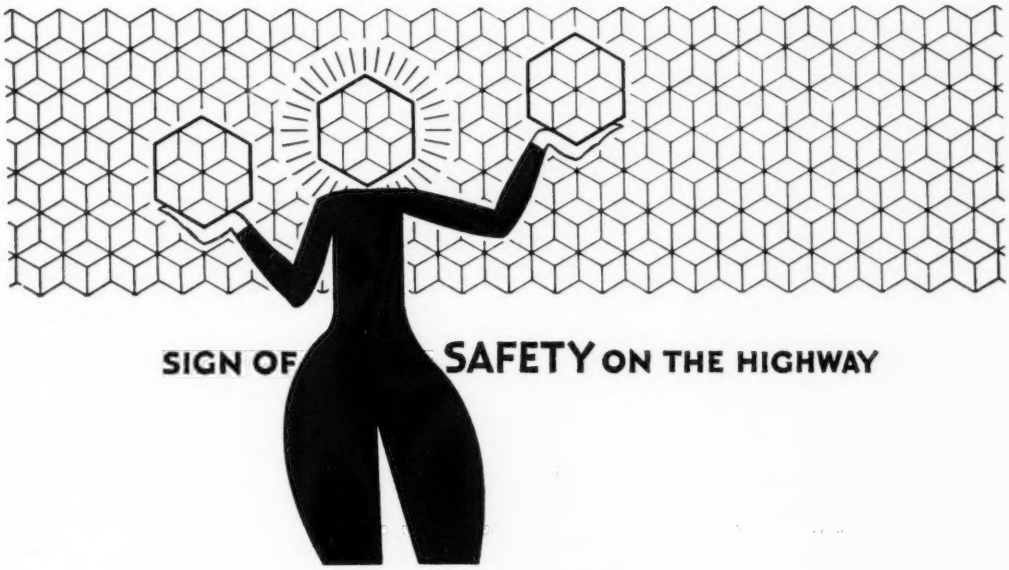

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lutions Committee, and their adoption by the delegation. (These resolutions are published elsewhere in this issue.)

The Technical Field Trip was greatly enjoyed by several hundred delegates. The new Hollywood Freeway, the Arroyo Seco Parkway, and other highway facilities in the vicinity of Los Angeles were inspected during the tour.

LOOKING AHEAD

OCTOBER 22-24, 1951—NEW YORK, N. Y.
33rd Annual Meeting. American Standards Association. Waldorf - Astoria Hotel.

OCTOBER 23-26, 1951—OMAHA, NEBRASKA
American Association of State Highway Officials. Annual meeting.

NOVEMBER 12-15, 1951—ATLANTIC CITY, N. J.
National Electrical Manufacturers Association. Haddon Hall Hotel.

NOVEMBER 25-30, 1951—ATLANTIC CITY, N. J.
Annual Meeting. American Society of Mechanical Engineers. Chalfonte-Haddon Hall.

JANUARY 15-18, 1952—WASHINGTON, D. C.
Highway Research Board. Annual Meeting.

APRIL 28-30, 1952—WASHINGTON, D. C.
Annual Meeting. Chamber of Commerce of United States.

SEPTEMBER 8-13, 1952—CHICAGO, ILLINOIS
Illuminating Engineering Society, National Technical Conference. Edgewater Beach Hotel.

IRF Board of Directors Enlarged

The board of directors, International Road Federation, has been increased to 16 members with the election of eight additional directors. Enlargement of the board was authorized at the annual meeting of the Federation last May due to expanding activities and growing responsibilities of the Federation.

The Federation, known as IRF, was formed in 1948 as an international clearing house for information on highways and highway transportation. It has offices in Washington, Paris, and London, and is the parent organization for national good roads association affiliates in more than 30 countries.

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Annual Meeting Resolutions

The following Resolutions were prepared by a special committee and approved by the Board of Direction of the Institute of Traffic Engineers, and the membership, at the 22nd Annual Meeting.

1. WHEREAS, the 22nd Annual Meeting of the Institute of Traffic Engineers has been an outstanding success with respect not only to programs, attendance and interest, but also as to arrangements for the comfort, convenience and entertainment of delegates and guests, and

WHEREAS, the planning which has made possible this successful meeting is the direct result of the thought and painstaking efforts of the local arrangements committee, now therefore

BE IT RESOLVED, that the ITE extends its grateful thanks and appreciation to the Western Section, ITE for its hospitality, and to Joe Havenner, Chairman of Local Arrangements, and Al Hutchison, Chairman of Technical Sessions Committee, as well as to all members of these committees as listed on the official program for giving so freely and willingly of their time and energy on our behalf.

—o—

2. RESOLVED, that those members in attendance at the 22nd Annual Meeting, and in behalf of those who were unable to be with us, extend to our outgoing President, Harry Neal, our sincere appreciation for his wise and vigorous leadership of the Institute of Traffic Engineers for the past year during which period the Institute has not only increased in members but has continued to increase in prestige and influence in the traffic and transportation matters of the nation. We shall continue to look to him for his wise counsel in future affairs of the Institute.

—o—

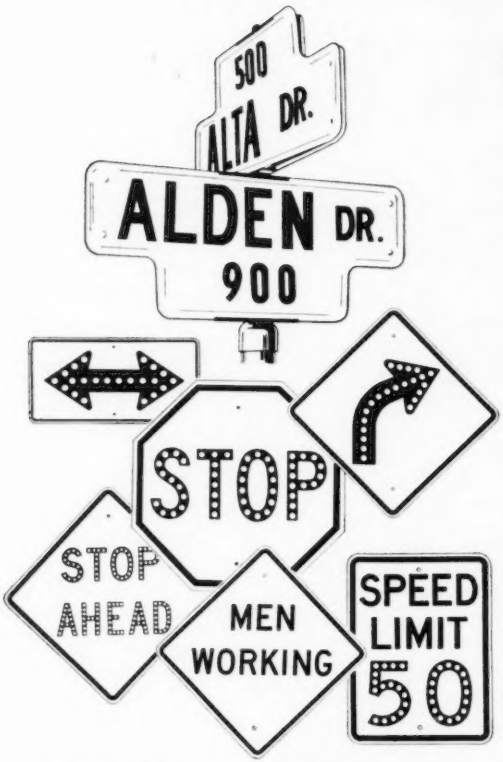
3. RESOLVED, that those in attendance at the 22nd Annual Meeting of the Institute of Traffic Engineers extend our sincere appreciation to the many supporting organizations for their valuable contributions to the success of this memorable annual event of the Institute in Los Angeles, and

BE IT FURTHER RESOLVED, that the Board of Direction recognize

(Continued on page 36)

TO EFFECTIVE

TRAFFIC CONTROL.....



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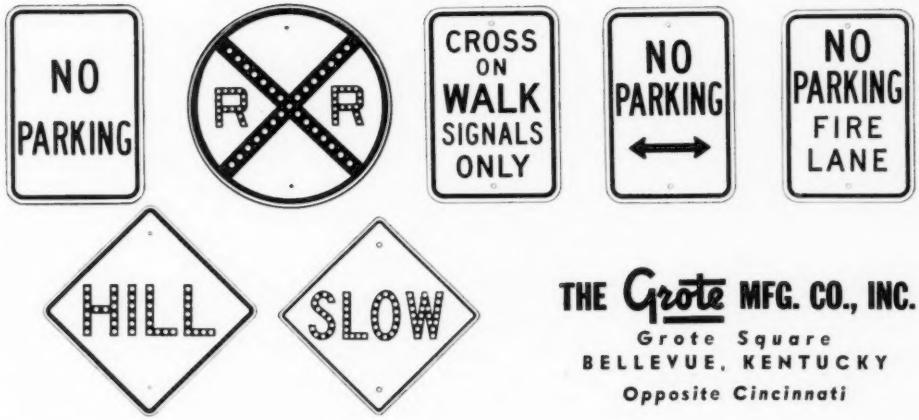

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(Continued from page 34)

this report by an appropriate letter of apreciation to each of these organizations.

4. WHEREAS, it has become apparent that the scope of the profession of traffic engineering is not clearly set forth in any document nor is it understood by many persons outside the profession, and

WHEREAS, the Institute of Traffic Engineers is the logical organization to prepare and disseminate information relative to traffic engineering, therefore:

BE IT RESOLVED, that the Officers of the Institute take the necessary steps to prepare a statement of the various types of work encompassed by the said profession of traffic engineering and provide as widespread distribution of the statement as possible.

—o—

5. WHEREAS, the Federal Government of the United States has established a National Civil Defense program for the protection of human life and property in the event of major disaster, either from war or natural causes, and

WHEREAS, the implementation of this program must be done by local, state, and county governments, and

WHEREAS, the utilization and conservation of the transportation facilities of the nation are vital to such a program, and

WHEREAS, the traffic engineers in the various levels of government are well qualified to bring about such utilization and conservation, now therefore:

BE IT RESOLVED, that the members of the Institute of Traffic Engineers enter voluntarily into the Civil Defense program in their own community and that they offer their technical services and advice to their state and local Civil Defense Councils.

—o—

6. WHEREAS, it is obvious that limited access highways are a vital necessity to the Nation's metropolitan areas and would serve to minimize congestion in the event of an attack by enemy bombers, and

WHEREAS, construction of several such projects in various states for which rights of way have already been acquired and plans and specifications prepared, is now being retarded as a result of insufficient alloca-

(Continued on page 40)

Contributing Organizations to Annual Meeting

The following organizations contributed to the success of the 22nd Annual Meeting (note Resolution No. 3).

American Gas Accumulator Co.
A-1 Signal Co.
Armco Drainage & Metal Products
Asbury Transit Lines
Automatic Signal Division
Automobile Club of Southern Calif
J. E. Bauer Co.
Bullock's Wilshire
California Metal Enameling Co.
California Motor Transport Assns.
Consolidated Western Steel Corp.
Dual Parking Meter Co., The
Duncan Parking Meter Corp.
Eagle Signal Corp.
Econolite Corp.
Electric Agencies
Elwood Wiles Co.
Fischbach and Moore, Inc.
Fowler Manufacturing Co., The
General Paint Corp.
General Traffic Controls, Inc.
Grace Sign & Manufacturing Co.
Grote Manufacturing Co., The
International Business Machines Corp.
Interstate Rubber Products Co.
Kelly-Creswell Co.
Line Material Co.
Los Angeles Chamber of Commerce
Luxor Lighting Products, Inc.
Magee-Hale Park-O-Meter Co.
Marbelite Co.
Michaels Art Bronze Co., Inc.
The Mi-Co Meters Division
Minnesota Mining & Mfg. Co.
Pacific Union Metal Co.
Prismo California Co.
Prismo Safety Corp.
Pyramid Waterproofing Compound
Reflexite Corp.
Safeway Sign Co.
Saf-T-Dot Marker Corp.
Sather Electric Distributors
Security First National Bank
Sinclair Paint Co.
Streeter-Amet Co.
Tanner Motor Tours
Twentieth Century-Fox Film Corp.
Union Metal Manufacturing Co., The
Union Pacific Railroad
United States Spring & Bumper Co.
Washington Motor Transport Assoc.
Charles R. Watts & Co.
Western Asphalt Association
Western Highway Institute
Yellow Cab Company

Statement of the ownership, management, and circulation required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) of Traffic Engineering published monthly at Plainfield, New Jersey, for October 1, 1951.

State of New Jersey } ss.
County of Union }

1. The names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher—Interstate Printing Corporation, Plainfield, N. J.

Editor—Fred W. Hurd, Strathcona Hall, New Haven 11, Conn.

Managing Editor—Miss Ann S. Lincoln, Strathcona Hall, New Haven 11, Conn.

Business Manager—Miss Ann S. Lincoln, Strathcona Hall, New Haven 11, Conn.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other un-incorporated firm, its name and address, as well as that of each individual member, must be given.)

Institute of Traffic Engineers, Strathcona Hall, New Haven 11, Conn.

President—Nathan Cherniack, Port of New York Authority, New York 11, N. Y.

Vice-President—F. B. Crandall, Oregon State Highway Dept., Salem, Oregon.

Vice-President—Donald M. McNeil, Bureau of Planning, Pittsburgh 19, Pa.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semi-weekly, and triweekly newspapers only.).....

OSMUN FORT,
Publisher

Sworn to and subscribed before me this 1st day of October, 1951.

WILLIAM L. CHRISTIAN,
[Seal] Notary Public of N. J.

Personalities . . .

RALPH T. DORSEY (Mem., ITE) has probably been in the traffic engineering business longer than any of the persons who will read this article. Ralph started off in the early days of traffic signal development as an electrician. Those were the days when backyard inventors by the dozens were dreaming up new devices for controlling traffic at intersections. To him fell the job of

maintaining and installing these devices, both experimental and permanent, in the City of Los Angeles, and by 1924 he was officially the Traffic Engineer of Los Angeles, establishing a possible first.

Although somewhat short on formal education, Ralph Dorsey by voracious reading of all material published concerning traffic control and theory, together with nighttime studies, rapidly became one of the best informed persons in the country in the field of traffic engineering, and so he is regarded today.

Ralph Dorsey has stayed on top of the job for all these many years and has successively headed the Traffic Signal Division, the Street Traffic Engineering Bureau and the Department of Traffic Engineering, through its several stages of development. He is now threatening to retire but will most certainly have left a mark to be remembered in the field of traffic engineering as a whole and, most specifically, with the development of the complex system of traffic engineering controls now provided in Los Angeles.

Ralph is a grandfather many times over and presently owns a home in Manhattan Beach, just outside of Los Angeles. He has no definite plans for the future but it is a pretty safe bet by all those who know him that when he retires, he will remain active in traffic engineering.

JOSEPH E. HAVENNER (Mem., ITE), civil engineer, traffic engineer, veteran of Guadalcanal and manager of the Public Safety Department of the Automobile Club of Southern California, has been active in his professional fields—on a local, state, regional and nationwide basis—ever since his graduation from Oregon State College in 1940 with a B.S. in Civil Engineering.

He even "kept his hand in" during his three and one-half years of World War II service. He was stationed on Guadalcanal with the Fourteenth U. S. Naval Construction Battalion for nine months of the initial campaign in the Solomons and the work his group did in airport and highway construction on that hotly-contested island earned a Presidential Unit Citation. He also spent two years at the U. S. Navy's important base at Port Hueneme, Calif., as Training and Construction Officer. He is now on active duty as a Lieutenant in the USNR.

Joe has been associated with the Automobile Club of Southern California since 1941 (with time out for war service) and has been Manager of the Club's Public Safety Department since 1946.

In his present capacity, he supervises all traffic engineering activities, including consultation to cities, traffic safety consultation to schools and colleges, and the preparation of safety educational materials. He has supervised and prepared traffic engineering reports for many Southern California cities and has given consultation on special projects to many other cities.

Mr. Havenner and the Auto Club have taken a leading role in pioneering and developing driver education courses in California high schools. During 1950 the Club, in cooperation with automobile dealers, provided 110 dual-control cars to Southern California high schools.

Before coming to the Automobile Club he served as an engineer for the Metropolitan Water District of Southern California, and, later, as a field engineer and speed zoning engineer for the Traffic Engineering Division, Oregon State Highway Department.

Joe is a member of the American Society of Civil Engineers and the American Society of Safety Engineers. He is a member of the Committee on Engineering, President's Highway Safety Conference, a vice-chairman of the Traffic Section of the National Safety Council; active in many other civic and professional organizations. He is a graduate of the Yale University Bureau of Highway Traffic.

Mr. Havenner is married, has two daughters, and lives in San Marino.

Civil Defense Radio Chain Operates in New York State

An effective Civil Defense radio network of more than 100 stations in New York State is attracting national attention.

Organized voluntarily by executives of large and small stations, the network broadcasts a weekly series titled "Plan for Survival." These programs not only present authoritative civil defense information but also serve as a weekly test of the radio facilities through which the public could receive instructions during an emergency.

The network operates by direct radio pickup, rather than the usual land lines, which would permit it to function if telephone service were knocked out.

"Plan for Survival" originates at a different station each week, with all other stations picking up the program from the originator. Many stations also transcribe "Plan for Survival" for playback at more convenient listening hours than the regular 11:30 to 11:45 Wednesday night spot.

Eight out of ten vacationists travel by car—14 per cent travel more than 2000 miles per trip. Forty-nine per cent travel 600 miles or more.

SECTION NEWS

Washington Section

The Washington Section held its Annual Outing recently at the O. K. Normann Farm and Sport Center which is located 11 miles south of Washington on the Shirley Highway. Over 40 persons attended and enjoyed the sports activities which included softball, swimming in O. K.'s deluxe pool, badminton, ping pong and horseshoes. Prizes were given to the winners of each activity, Darrell Trueblood and Don Loutzenheiser taking the men's ping pong tourney. Mrs. Steve Butterfield teamed with Mrs. Roy Jorgensen to capture the ladies ping pong. Charlie Prisk and Roy Jorgensen defeated the best of the challengers in the men's badminton, with Mrs. Earl Allgaier and Mrs. Nat Gordon doing likewise in the ladies class.

The horseshoe tourney attracted the largest turnout of the day and Sam Hitchcock and LeVerne Johnson lasted through many elimination rounds to take the nod in that event. It was rumored that Johnny had spent his vacation practicing for this contest.

The biggest event of the day, for most people, occurred when the Outing Committee, comprised of Ken Rykken, Hank Evans, Bob Holmes, and Irving Knott announced that "chow" was served. Hank and Ryk did themselves proud over the outdoor grill and everyone enjoyed the tasty repast.

The concluding event of a very successful day was an auction sale of the items that were not eaten.

Western Section

Your retiring Secretary-Treasurer wishes to take this opportunity to express to each and every one of you his appreciation for your whole-hearted cooperation.

Herb Higgins has been moved up from Traffic Engineer to Office Engineer for the Washington Department of Highways and Rex Still is Acting Traffic Engineer. Congratulations, fellows!

Paul Wagner, District Traffic Engineer of San Luis Obispo, has been carrying on "battles" with the Army over access at Fort Ord and other miscellaneous unrelated traffic control problems.

Bob Livingston, over Colorado way, has been moved up to Traffic and Planning Engineer and Al Pepper has been made head of the Traffic Division.

The Portland Area group met recently in Portland with Carlton Robinson acting as chairman of the group. Although the attendance was not large, it was mighty, in more ways than one. It is understood that traffic matters were discussed but we rather question at what length. The following persons attended: Lee Kies, Val Johnson, Lawrence George, Carlton Robinson, P. H. Michael, Bill Betzer, Clair Jones, Joe Skelton, D. J. Barbee, Donald Bergstrom, George Ward and David Magin.

Bob Dier of Fresno has accepted the Traffic Engineer job in Long Beach vacated when Alec Napier went back into the Armed Services. I understand Bob gets a good deal—separate department under new city charter amendment, etc.

Cliff Clark spent two weeks recently learning how to fight for the Army in Reserve duty.

Pete Rask is letting Pasadena's traffic go to the devil while he paints his kitchen.

Jake Young will not attend the *Begonia Society* meeting this year due to press of work.

Dick Wilson threw a big party at his Sierra Lodge not too long ago. No bones were broken since no one went skiing.

Nick Carter spends every week-end in Ashland, Oregon. He has a big lawn to mow or something. His co-workers hear a lot about how to farm from him, but they wonder if he tells the cows and chickens about traffic.

John W. McDonald, recently admitted Junior Member of ITE and formerly of Ventura, California, has been called to active duty with the U. S. Air Force. He has been placed in the Ground Safety Program due to his efforts in traffic engineering. His current mailing address is: 1st Lt., USAF, Ground Safety Officer, Headquarters, Air Research and Development Command, Box 1395, Baltimore 3, Maryland.

Mrs. Betty Vanderwal, your secretary's "right arm," has been responsible for several of the recent issues of *Westernite*. I wish to take this opportunity to express my appreciation to her and also to publicly announce that your praises to the Secretary-Treasurer have been *misdirected* in many instances, but he has reluctantly passed them on to Mrs. Vanderwal.

I have been requested by Fred Fowler, our President, and Joe Havenner, our Vice-President, to express to all of you in their behalf their gratitude for the efforts that you have set forth in promoting traffic engineering in your community, state, and our western area. The officers extend their particular thanks to the Convention Committee and those of you who have worked so wholeheartedly with this group in making the Western Section part of the Annual Meeting a worthwhile endeavor.

The results of the election of Western Section officers at the Annual Meeting in Los Angeles are as follows: President, Joseph E. Havenner; Vice-President, Herbert C. Higgins; and Secretary-Treasurer, Donald S. Berry.

Your news notes should be directed to your new Secretary-Treasurer, Don Berry, who also assumes the editorship of *Westernite*. His address is as follows:

Institute of Transportation and Traffic Engineering, Room 114, Building T-11, University of California, Berkeley 4, California.

Reported by J. Al. Head
Secretary-Treasurer.

California Wins Annual Award

For the third time during his tenure of office, Governor Earl Warren, of California, has been presented with the Annual Award in recognition of California's outstanding engineering performance.

The award was handed to Governor Warren by F. M. Carter, Director of the Institute of Traffic Engineers, at a brief ceremony at the Fairmont Hotel in San Francisco which was a part of the second day's program of the Western Association of State Highway Officials.

State Highway Engineer McCoy holds annual award which was presented to Governor Warren, left, by F. M. Carter, extreme right. In center, U. S. Commissioner of Public Roads McDonald (Hon. Mem., ITE) and Public Works Director Purcell.

SETTLE THESE 2 QUESTIONS

—before you buy parking meters!

1 How much will it cost to keep them operating 5 or 10 years from now?

2 Will they earn as much 5 or 10 years after installation?

SEE REGULATIONS ON OTHER SIDE
INSERT ONE COIN AT A TIME
TURN HANDLE TO STOP AFTER EACH COIN
FREE PARKING ON SUNDAYS
MI-CO METER

The manufacturer who can answer these questions with positive proof of meter performance over a five- or ten-year or even longer period of time, is the one you should do business with.

Some parking meters last much longer and earn more during their productive life than others. Why? Because certain types of meters are so complicated and the mechanism so intricate, they cannot take for any length of time the punishment to which meters are subjected. Sure, they'll operate, but it's a tough, costly job to keep them going.

MI-CO METERS ARE MANUALLY OPERATED They do not require the complicated mechanism necessary to operate so-called automatic meters. On some MI-CO models there are only six moving parts. As a result MI-CO's are seldom out of order. Their construction is rugged and simple. If a meter should require attention, the adjustment can usually be made in a few minutes at the meter location. Such dependability is reflected in extremely low maintenance and high earnings over a greater number of years.

And turning the handle of a MI-CO meter is no hardship on the motorist. It's no more effort than turning the ignition key of his car. The important thing is that the motorist gets the exact amount of time he buys—no more—no less—*and he gets it every time.*

Motorists like MI-CO's. Merchants endorse them. They build good will as well as regulate traffic.

Before you buy or replace worn out meters, let us send you the reasons why we believe your parking meter dollars will go much further with MI-CO's.

MI-CO METERS, 241 Court St., Covington, Ky.

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Robinson Winner of Past Presidents' Award

Mr. Carlton C. Robinson (Junior ITE), Assistant Traffic Engineer, Bureau of Traffic and Transportation, Portland, Oregon, was announced the winner of the Past Presidents' Award for Merit in Traffic Engineering at the Annual Banquet of the *Institute* held in Los Angeles, September twenty-sixth. Mr. Robinson's winning paper "Pedestrian Interval Acceptance" was based on research conducted while he was a student at the Bureau of Highway Traffic, Yale University. Mr. Robinson attended the Bureau as the recipient of the Gordon-Cass Memorial Fellowship which is provided by the American Transit Association and completed his work at Yale in June 1951.

Mr. Robinson's paper was outstanding in originality and research achievement. It is concerned with the time-space requirements of pedestrians at crosswalks as they pass through gaps in vehicular flow. The characteristics of pedestrian flow at signalized crossings and across one-way streets are also analyzed. The paper will be published in the 1951 Annual Meeting Proceedings of the *Institute* which will be available by January first.

Mr. Wilbur S. Smith, Chairman of the Committee of Judges, made the award presentation. He pointed out that the competition is open only to Junior and Associate Members of the *Institute* who are under thirty-five years of age. "The winner of the award," he added, "should rightfully feel proud of his accomplishment; it is fitting that his contribution to the knowledge of traffic engineering should be recognized."

The Past Presidents' award was established this year for the first time by the *Institute* although a number of other technical groups and societies have offered similar awards over a period of many years. It is the intent of the Officers and Past Presidents of the *Institute* to make the Award a coveted honor within the Profession.

(Continued from page 36)

tions of steel for highway purposes, therefore

BE IT RESOLVED, that the Institute of Traffic Engineers petition the appropriate officials of the U. S. Government to allocate sufficient steel and other critical materials for highway purposes, so that the construction of such vitally needed improvements can proceed on schedule.

Resolutions Committee

J. C. Young, *Chairman*
F. T. Fowler
R. Gallagher
J. E. Reading
L. J. Sorenson

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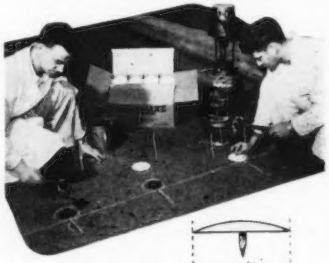

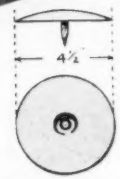

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- **DUR-O-LINE** markers can be used on either asphalt or concrete pavements.

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As a special offer 200 markers and laying material for 400 to 1200 linear feet is available for only $52. ($67. for concrete streets.) Test this sample offer on your busiest street. Shipped prepaid.

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Super-strong Hyway Guards safely deflect cars and cushion shock to vehicle, occupants and rail. Easily seen by day or night. Speedy, permanent erection with little or no maintenance required.

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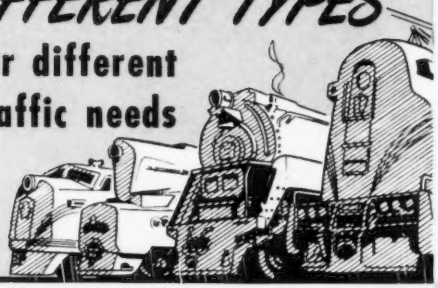

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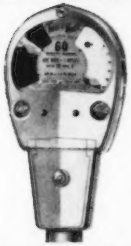

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No doubt about it! Quality is apparent from first inspection. Letters are deep embossed on 18-ga. galvanized, "Bonderized" steel. Contrasting baked enamel colors for letters and border. Very rigid.

Miro-Flex street name assemblies are in demand the country over. They are made for all conventional street marking – two-way or four-way in pole top or bracket type. Write for complete catalog of standard signs for marking highways or streets and traffic control signs.

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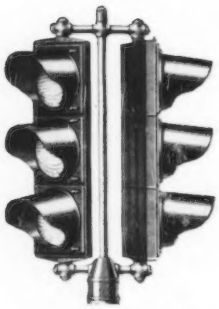
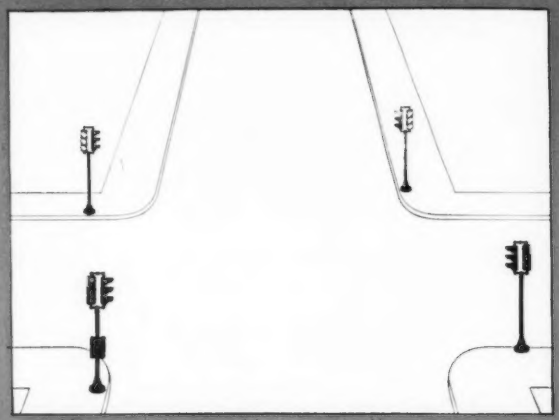
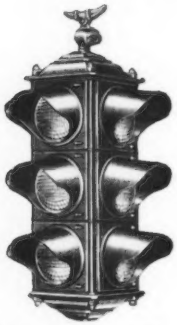


Type TRP-223D

Two-way, Three-section Adjustable Signal For Post Top Mounting

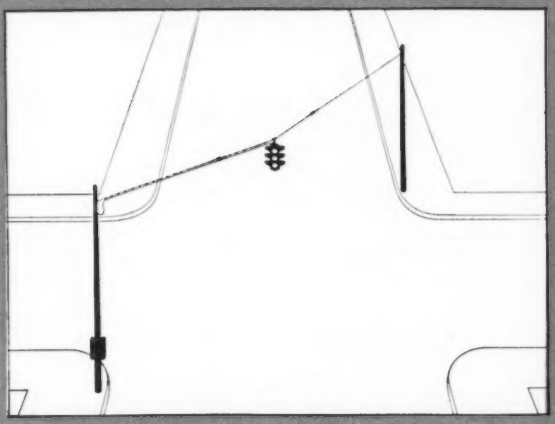


Typical Installation of TRP-223D Two-Way Post Mounted Signal

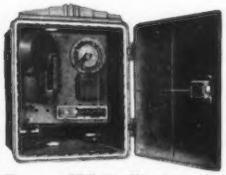


Type TSW-443D

Four-way Three-section Non-Adjustable Signal For Mounting on a Span Wire



Typical Installation of TSW-443D Span-Wire Signal



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Six Signal Circuits — 4 to 16 Intervals

Crouse-Hinds Catalog 226 lists a complete line of traffic signals, beacons, flashers, and a series of controllers designed to help you solve your traffic control problems ... from simple installations up to the most complex heavy traffic problem. Send for your copy.

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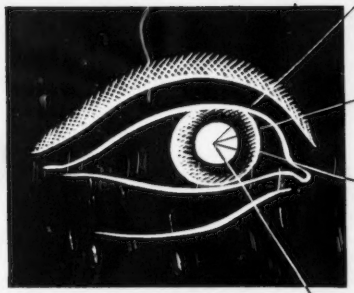

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Advertisement

TRAFFIC SIGNS OF NEW MATERIAL PROVE SUPERIOR IN TEXAS

HOUSTON, Texas—Traffic control signs utilizing a revolutionary new base material are being made in Houston and sold nationally, it was announced by Harry Yonkers, president of Econo Signs, Inc.

Signs of the new material cost on the average 50 percent less than conventional metal signs, Yonkers said.

"Naturally such a big saving makes a hit with municipalities whose traffic control problems always outrun their budgets," he added. "But actually low cost is only one advantage of Econo signs. They also last longer and look better."

Duolux is the new base material being used in Econo signs. The material has been thoroughly tested in one of the worst sign climates in the country —the Texas Gulf Coast. Houston has more than 18,000 Duolux material signs in use now, and Dallas several thousand.

"Last Much Longer"

Houston traffic officials confirm that Duolux signs have been completely satisfactory. One official said: "Because of their low cost, as compared with metal, we find it's cheaper to replace with signs made of Duolux material than to repair old metal signs in our city sign shop.

"We've had thousands of such signs in use under all conditions. In our opinion, they actually last much longer than metal signs and are not adversely affected by bad weather conditions. They certainly look better longer."

Econo Ships Promptly

Output of Econo signs is not curtailed by material shortages. Most orders for standard Econo traffic signs are filled from stock and shipped at once. Non-standard signs are usually shipped within a week.

Many municipalities, Yonkers said, are taking advantage of a "Special Test Offer" the Econo company offers. This involves a trial order of standard signs in several sizes at a special price. "For a very low cost," Yonkers says, "cities are testing our signs under their local conditions, and seeing for themselves that Econo Signs do the job better and more economically."

Announcing

ECONO SIGNS for traffic control

Made of revolutionary new material!

Not metal, but better. Econo signs are fabricated of an entirely new base material, Duolux. Both sides are surfaced hard and smooth. Duolux is very light, yet incredibly hard to break.

Most important, Duolux doesn't rust, corrode, absorb moisture, swell, split, or crack.

More than 20,000 signs of Duolux material have stood up amazingly well under tough Gulf Coast weather conditions. Houston and Dallas have been using thousands of Duolux signs. They report it's *cheaper* to replace with these signs than to repair old metal signs.

Econo signs are enameled both sides, very easy to clean. Surfaces won't chalk. Coating and message colors are fast and fade-proof. All signs are available plain or with full reflectorized background.

Plain or reflectorized, Econo signs cost you just about *half* as much as metal signs of comparable size!

Write for Econo descriptive material, prices, and details of "Special Test Offer."

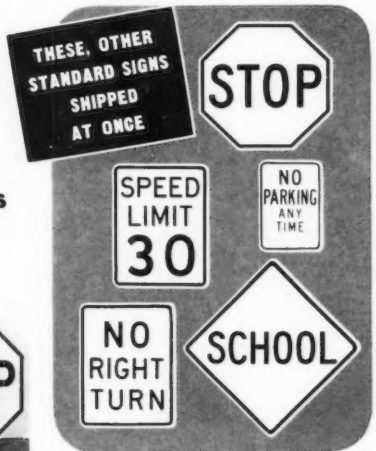
Advantages:

1. First cost, 50% less
2. Look better longer
3. Do not corrode, rust
4. Light, easy to handle
5. Paint "stays put"
6. National standard lettering, messages, sizes, shapes, colors

AVAILABLE NOW!

Rusted old metal sign New Econo sign

Cheaper to replace with Econo than to repair old signs!



- **Sign sizes, shapes and colors** conform to Manual on Uniform Traffic Control Devices.
- **Lettering** as recommended by U.S. Bureau of Public Roads.
- **Non-standard** Econo signs made to order quickly. Write for prices . . .

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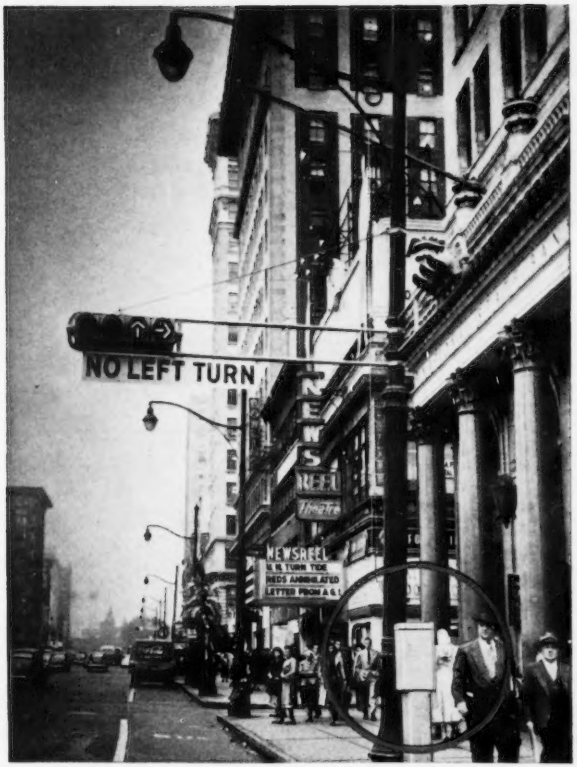
Type F Controller



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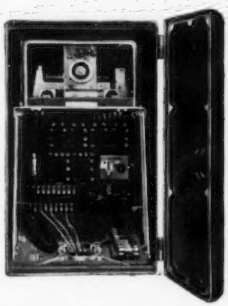
PROVIDES FOR *ALL* YOUR TRAFFIC NEEDS!

The G-E expansible Type F controller is universally applicable in the field of pre-timed traffic control, interconnected or non-interconnected. Simple addition of dial units and relays adapts the control to more complex traffic problems as the need arises.

Unitized construction of the timer and its dial units makes it easy to expand, install and maintain the Type F Controller. Moreover, simplified design and precision-built parts assure long, trouble-free life.

For more information about the G-E Type F Controller, write for Bulletin GEA-5481. Address your nearest Apparatus Sales Office or General Electric, Schenectady, New York.



The Dial Units, Flasher and other major assemblies are jack-mounted for expansibility and accessibility. More and more communities are learning that the Type F Controller is just what they need for flexible traffic direction.

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